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THE ANGLO-SAXONS OF THE KENTUCKY  
MOUNTAINS:\*

A STUDY IN ANTHROPOGEOGRAPHY

BY

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In one of the most progressive and productive countries of the world, and in that section of the country which has had its civilization and its wealth longest, we find a large area where the people are still living the frontier life of the backwoods, where the civilization is that of the eighteenth century, where the people speak the English of Shakespeare's time, where the large majority of the inhabitants have never seen a steamboat or a railroad, where money is as scarce as in colonial days, and all trade is barter. It is the great upheaved mass of the Southern Appalachians which, with the conserving power of the mountains, has caused these conditions to survive, carrying a bit of the eighteenth century intact over into this strongly contrasted twentieth century, and presenting an anachronism all the more marked because found in the heart of the bustling, money-making, novelty-loving United States. These conditions are to be found throughout the broad belt of the Southern Appalachians, but nowhere in such purity or covering so large an area as in the mountain region of Kentucky.

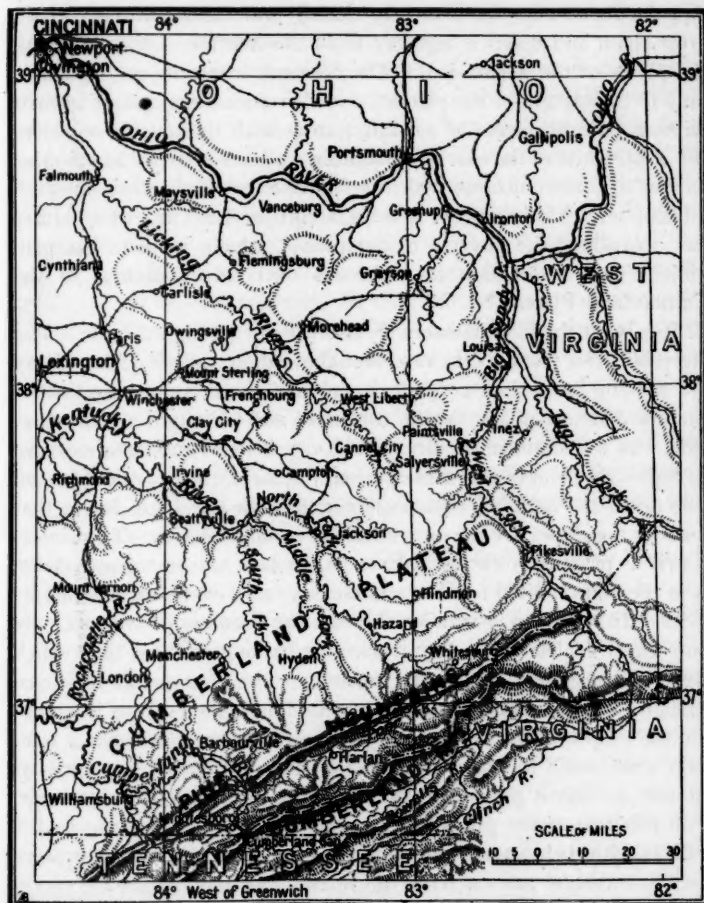
A mountain system is usually marked by a central crest, but the

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Appalachians are distinguished by a central zone of depression, flanked on the east by the Appalachian Mountains proper, and on the west by the Allegheny and the Cumberland Plateaus. This central trough is generally designated as the Great Appalachian Valley. It is depressed several hundred feet below the highlands on either side, but its surface is relieved by intermittent series of even-crested ridges which rise 1000 feet or more above the general level, running parallel to each other, and conforming at the same time to the structural axis of the whole system. The valleys between them owe neither width nor form to the streams which drain them. The Cumberland Plateau forms the western highland of the Great Valley in Eastern Kentucky, Tennessee, and Northern Alabama. This plateau belt reaches its greatest height in Kentucky, and slopes gradually from this section to the south and west. Its eastern escarpment rises abruptly 800 to 1500 feet from the Great Valley, and shows everywhere an almost perfectly straight skyline. The western escarpment is very irregular, for the streams, flowing westward from the plateau, have carved out their valleys far back into the elevated district, leaving narrow spurs running out into the low plains beyond. The surface is highly dissected, presenting a maze of gorge-like valleys separating the steep, regular slopes of the sharp or rounded hills. The level of the originally upheaved mass of the plateau is now represented by the altitude of the existing summits, which show a remarkable uniformity in the northeast-southwest line, and a slight rise in elevation from the western margin towards the interior.

About 10,000 square miles of the Cumberland Plateau fall within the confines of the State of Kentucky, and form the eastern section of the State. A glance at the topographical map of the region shows the country to be devoted by nature to isolation and poverty. The eastern rim of the plateau is formed by Pine Mountain, which raises its solid wall with level top in silhouette against the sky, and shows only one water-gap in a distance of 150 miles. And just beyond is the twin range of the Cumberland. Hence no railroads have attempted to cross this double border-barrier, except at the northeast and southeast corners of the State, where the Big Sandy and Cumberland Rivers have carved their way through mountains to the west. Railroads, therefore, skirt this upland region, but nowhere penetrate it. The whole area is a coalfield, the mineral being chiefly bituminous, with several thousand square miles of superior cannel coal. The obstructions growing out of the topography of the country, and the cheap river transportations afforded by the Ohio for the Kanawha



EASTERN PART OF KENTUCKY.

Note the very small development of railroads.

and Monongahela River coal have tended to retard the construction of railroads within the mountains, and even those on the margin of this upland region have been built since 1880.

Man has done so little to render this district accessible because nature has done so little. There are here no large streams penetrating the heart of the mountains, as in Tennessee, where the Tennessee River, drawing its tributaries from the easternmost ranges of the

Appalachians, cuts westward by flaring water-gaps through chain after chain and opens a highway from the interior of the system to the plains of the Mississippi. The Kentucky streams are navigable only to the margin of the plateau, and therefore leave this great area without natural means of communication with the outside world to the west, while to the east the mountain wall has acted as an effective barrier to communication with the Atlantic seaboard. Consequently, all commerce has been kept at arms' length, and the lack of a market has occasioned the poverty of the people, which, in turn, has prohibited the construction of highroads over the mountains of the Cumberland Plateau.

It is what the mountaineers themselves call a rough country. The steep hills rise from 700 to 1200 feet above their valleys. The valleys are nothing more than gorges. Level land there is none, and roads there are almost none. Valley and road and mountain stream coincide. In the summer the dry or half-dry beds of the streams serve as highways; and in the winter, when the torrents are pouring a full tide down the hollows, foot trails cut through the dense forest that mantles the slopes are the only means of communication. Then intercourse is practically cut off. Even in the best season transportation is in the main limited to what a horse can carry on its back beside its rider. In a trip of 350 miles through the mountains, we met only one wheel vehicle and a few trucks for hauling railroad ties, which were being gotten out of the forests. Our own camp waggons, though carrying only light loads, had to double their teams in climbing the ridges. All that had been done in most cases to make a road over a mountain was to clear an avenue through the dense growth of timber, so that it proved, as a rule, to be just short of impassable. For this reason the public of the mountains prefer to keep to the valleys with their streams, to which they have given many expressive and picturesque names, while the knobs and mountains are rarely honored with a name. We have Cutshin Creek, Hell-fer-Sartain, Bullskin Creek, Poor Fork, Stinking, Greasy, and Quicksand Creek. One trail leads from the waters of Kingdom-Come down Lost Creek and Troublesome, across the Upper Devil and Lower Devil to Hell Creek. *Facilis descensus Averno*, only no progress is easy in these mountains. The creek, therefore, points the highway, and is used to designate geographical locations. When we would inquire our way to a certain point, the answer was, "Go ahead to the fork of the creek, and turn up the left branch," not the fork of the road and the path to the left. A woman at whose cabin we lunched one day said,



"My man and me has been living here on Quicksand only ten years. I was born up on Troublesome."

All passenger travel is on horseback. The important part which the horse plays, therefore, in the economy of the mountain family recalls pioneer days. Almost every cabin has its blacksmith's forge under an open shed or in a low outhouse. The country stores at the forks or fords of the creek keep bellows in stock. Every mountaineer is his own blacksmith, and though he works with very simple implements, he knows a few fundamental principles of the art, and does the work well. Men and women are quite at home in the saddle. The men are superb horsemen, sit their animals firm and erect, even when mounted on top of the meal-bag, which is the regular accompaniment of the horseman. We saw one day a family on their way to the country store to exchange their produce. The father, a girl, and a large bag of Indian corn were mounted on one mule, and the mother, a younger girl, and a black lamb suspended in a sack from the saddle-bow on the other. It is no unusual thing to see a woman on horseback, with a child behind her and a baby in her arms, while she holds an umbrella above them.

But such travel is not easy, and hence we find that these Kentucky mountaineers are not only cut off from the outside world, but they are separated from each other. Each is confined to his own locality, and finds his little world within a radius of a few miles from his cabin. There are many men in these mountains who have never seen a town, or even the poor village that constitutes their county-seat. Those who have obtained a glimpse of civilization have gone down the head-waters of the streams on lumber rafts, or have been sent to the State penitentiary at Frankfort for illicit distilling or feud murder. The women, however, cannot enjoy either of these privileges; they are almost as rooted as the trees. We met one woman who, during the twelve years of her married life, had lived only 10 miles across the mountain from her old home, but had never in this time been back home to visit her mother and father. Another back in Perry county told us she had never been farther from home than Hazard, the county-seat, which was only 6 miles distant. Another had never been to the post-office, 4 miles away; and another had never seen the ford of the Rockcastle River, only 2 miles from her home, and marked, moreover, by the country store of the district.

A result of this confinement to one locality is the absence of anything like social life, and the close intermarriage of families inhabiting one district. These two phenomena appear side by side here as

in the upland valleys of Switzerland and other mountain countries where communication is difficult. One can travel for 40 miles along one of the head streams of the Kentucky River and find the same names recurring in all the cabins along both its shores. One woman in Perry County told us she was related to everybody up and down the North Fork of the Kentucky and along its tributary creeks. In Breathitt County, an old judge, whose family had been among the early settlers on Troublesome, stated that in the district school near by there were ninety-six children, of whom all but five were related to himself or his wife. This extensive intermarriage stimulates the clan instinct and contributes to the strength of the feuds which rage here from time to time.

It is a law of biology that an isolating environment operates for the preservation of a type by excluding all intermixture which would obliterate distinguishing characteristics. In these isolated communities, therefore, we find the purest Anglo-Saxon stock in all the United States. They are the direct descendants of the early Virginia and North Carolina immigrants, and bear about them in their speech and ideas the marks of their ancestry as plainly as if they had disembarked from their eighteenth-century vessel but yesterday. The stock is chiefly English and Scotch-Irish, which is largely Teutonic in origin. There is scarcely a trace of foreign admixture. Occasionally one comes across a French name, which points to a strain of Huguenot blood from over the mountains in North Carolina; or names of the Germans who came down the pioneer thoroughfare of the Great Appalachian Valley from the Pennsylvania Dutch settlements generations ago. But the stock has been kept free from the tide of foreign immigrants which has been pouring in recent years into the States. In the border counties of the district where the railroads run, and where English capital has bought up the mines in the vicinity, the last census shows a few foreign-born, but these are chiefly Italian laborers working on the road-bed, or British capitalists and employees. Four of the interior counties have not a single foreign-born, and eight others have only two or three.

Though these mountain people are the exponents of a retarded civilization, and show the degenerate symptoms of an arrested development, their stock is as good as any in the country. They formed a part of the same tide of pioneers which crossed the mountains to people the young States to the southwest, but they chanced to turn aside from the main stream, and ever since have stagnated in these mountain hollows. For example, over a hundred years ago eleven

Combs brothers, related to General Combs of the Revolutionary army, came over the mountains from North Carolina. Nine of them settled along the North Fork of the Kentucky River in the mountains of Perry County, one went further down the stream into the rough hill country of Breathitt County, and the eleventh continued on his way till he came into the smiling regions of the Bluegrass, and there became the progenitor of a family which represents the blue blood of the state, with all the aristocratic instincts of the old South; while their cousins in the mountain go barefoot, herd in one-room cabins, and are ignorant of many of the fundamental decencies of life.

If the mountains have kept out foreign elements, still more effectually have they excluded the negroes. This region is as free from them as northern Vermont. There is no place for the negro in the mountain economy, and never has been. In the days of slavery this fact had momentous results. The mountains did not offer conditions for plantation cultivation, the only system of agriculture in which slaves could be profitably employed. The absence of these conditions and of the capital wherewith to purchase negroes made the whole Appalachian region a non-slave-holding section. Hence, when the rupture came between the North and South, this mountain region declared for the Union, and thus raised a barrier of disaffection through the center of the Southern States. It had no sympathy with the industrial system of the South; it shared the democratic spirit characteristic of all mountain people, and likewise their conservatism, which holds to the established order. Having, therefore, no intimate knowledge of the negro, our Kentucky mountaineers do not show the deep-seated prejudice to the social equality of blacks and whites which characterizes all other Kentuckians. Till abolished by law four years ago, there existed on the western margin of the Cumberland Plateau, a flourishing college for the co-education of the Bluegrass blacks and mountain whites; and this is probably the only geographical location south of the Mason and Dixon line where such an institution could exist.

Though the mountaineer comes of such vigorous stock as the Anglo-Saxons, he has retained little of the ruddy, vigorous appearance of his forebears. The men are tall and lank, though sinewy, with thin bony faces, sallow skins, and dull hair. They hold themselves in a loose-jointed way; their shoulders droop in walking and sitting. Their faces are immobile, often inscrutable, but never stupid; for one is sure that under this calm exterior the mountaineer is doing a deal of thinking, which he does not see fit to share with

the "furriner," as he calls every one coming from the outside world. The faces of the women are always delicately moulded and refined, with an expression of dumb patience telling of the heavy burden which life has laid upon them. They are absolutely simple, natural, and their child-like unconsciousness of self points to their long residence away from the gaze of the world. Their manners are gentle, gracious, and unembarrassed, so that in talking with them one forgets their bare feet, ragged clothes, and crass ignorance, and in his heart bows anew to the inextinguishable excellence of the Anglo-Saxon race.

The lot of a mountain woman is a hard one. Only the lowest peasantry of Europe can show anything to parallel it. She marries between twelve and fifteen years a husband who is between seventeen and twenty. The motive in marriage is very elemental, betrays little of the romantic spirit. Husband and wife speak of each other as "my man" and "my woman." A girl when she is twenty is put on the "cull list," that is, she is no longer marriageable. A man is included in this undesirable category at twenty-eight; after that he can get no one to take him "except some poor wider-woman," as one mountain matron expressed it, adding, "gals on the cull-list spend their time jes' bummin' around among their folks." During a ride of 350 miles, with visits at a great many cabins, we met only one old maid; her lot was a sorry one, living now with a relative, now with a friend, earning her board by helping to nurse the sick or making herself useful in what way she could. The mountain system of economy does not take into account the unmarried woman, so she plunges into matrimony with the instinct of self-preservation. Then come children; and the mountain families conform to the standard of the patriarchs. A family of from ten to fifteen offspring is no rarity, and this characterizes not only the mountains of Kentucky, but the whole area of the Appalachian system. In addition to much child-bearing, all the work of the pioneer home, the spinning and weaving, knitting of stockings, sometimes even the making of shoes and moccasins, falls on the woman. More than this, she feeds and milks the cow, searches for it when it has wandered away "in the range" or forest, hoes weeds in the corn, helps in the ploughing, carries water from the spring, saws wood and lays "stake and ridered" fences. A mountain woman who had a husband and two sons, and who had been employed all day in making a fence, lifting the heavy rails above the height of her own head, replied in a listless way to the question as to what the men

did, with, "the men folks they mostly sets on a fence and chaw tobacco and talk politics."

The mountain woman, therefore, at twenty-five looks forty, and at forty looks twenty years older than her husband. But none of the race are stalwart and healthy. The lack of vigour in the men is due chiefly to the inordinate use of moonshine whiskey, which contains 20 per cent. more alcohol than the standard liquor. They begin drinking as mere boys. We saw several youths of seventeen intoxicated, and some women told us boys of fourteen or fifteen drank. Men, women, and children looked underfed, ill nourished. This is due in part to their scanty, unvaried diet, but more perhaps to the vile cooking. The bread is either half-baked soda biscuits eaten hot, or corn-pone with lumps of saleratus through it. The meat is always swimming in grease, and the eggs are always fried. The effect of this shows, in the adults, in their sallow complexions and spare forms; in the children, in pimples, boils, and sores on their hands and faces. This western side of the mountains, moreover, has not an abundant water-supply, the horizontal strata of the rocks reducing the number of springs. Hence all the mountain region of Kentucky, West Virginia, and Tennessee shows a high percentage of diarrhoeal diseases, typhoid, and malarial fever.

The home of the mountaineer is primitive in the extreme, a survival of pioneer architecture, and the only type distinctly American. It is the blind or windowless one-room log cabin, with the rough stone chimney on the outside. The logs are sometimes squared with the hatchet, sometimes left in their original form with the bark on; the interstices are chinked in with clay. The roofs are covered with boards nearly an inch thick and 3 feet long, split from the wood by a wedge, and laid on, one lapping over the other like shingles. The chimneys, which are built on the outside of the houses, and project a few feet above the roof, lend a picturesque effect to the whole. They are made of native rock, roughly hewn and cemented with clay; but the very poorest cabins have the low "stick chimney," made of laths daubed with clay. In the broader valleys, where the conditions of life are somewhat better, the double cabin prevails—two cabins side by side, with a roofed space between, which serves as a dining-room during the warmer months of the year. Sometimes, though rarely, there is a porch in front, covered by an extension of the sloping roof. In some of the marginal counties of the mountain region and in the sawmill districts, one sees a few two-story frame dwellings. These are deco-

rated with ornamental trimming of scroll-saw work in wood, oftentimes colored a light blue, along the edges of the gables, and defining the line between the two stories. The regulation balcony over the front door and extending to the roof has a balustrade of the same woodwork in excellent, chaste design, sometimes painted and sometimes in the natural color. These houses, both in their architecture and style of ornamentation, recall the village dwellings in Norway, though not so beautiful or so richly decorated. But the usual home of the mountaineer is the one-room cabin. Near by is the barn, a small square log structure, with the roof projecting from 8 to 10 feet, to afford shelter for the young cattle or serve as a milking-shed. These vividly recall the mountain architecture of some of the Alpine dwellings of Switzerland and Bavaria, especially when, as in a few instances, the roofs are held down by weight-rocks to economize hardware or protect them against the high winds. Very few of them have hay-lofts above, for the reason that only a few favored districts in these mountains produce hay.

The furnishings of the cabins are reduced to the merest necessities of life, though in the vicinity of the railroads or along the main streams where the valley roads make transportation a simpler problem, a few luxuries like an occasional piece of shop-made furniture and lamp-chimneys have crept in. One cabin which we visited near the foot of Pine Mountain, though of the better sort, may be taken as typical. Almost everything it contained was home-made, and only one iron-bound bucket showed the use of hardware. Both rooms contained two double beds. These were made of plain white wood, and were roped across from side through auger-holes to support the mattresses. The lower one of these was stuffed with corn-shucks, the upper one with feathers from the geese raised by the housewife. The sheets, blankets, and counterpanes had all been woven by her, as also the linsey-woolsey from which her own and her children's clothes were made. Gourds, hung on the walls, served as receptacles for salt, soda and other kitchen supplies. The meal-barrel was a section of log, hollowed out with great nicety till the wood was not more than an inch thick. The flour-barrel was a large firkin, the parts held in place by hoops, fastened by an arrow-head at one end of the withe slipped into a slit in the other; the churn was made in the same way, and in neither was there nail or screw. The washtub was a trough hollowed out of a log. A large basket was woven of hickory slips by the mountaineer himself, and two smaller ones made of the cane of the broom corn and bound at



the edges with coloured calico, were the handiwork of his wife. Only the iron stove with its few utensils, and some table knives, testified to any connection with the outside world. The old flint-lock gun and powder-horn hanging from a rafter gave the finishing touch of local colour to this typical pioneer home. Daniel Boone's first cabin in the Kentucky wilderness could not have been more primitive.

Some or most of these features can be found in all mountain homes. Some cabins are still provided with hand-mills for grinding their corn when the water-mills cease to run in a dry summer. Clay lamps of classic design, in which grease is burned with a floating wick, are still to be met with; and the manufactured product from the country store is guiltless of chimney. Every cabin has its spinning-wheel, and the end of the "shed-room" is usually occupied by a hand-loom. Only in rare cases is there any effort to beautify these mountain homes. Paper flowers, made from old newspaper, a wood-cut from some periodical, and a gaudy advertisement distributed by an itinerant vendor of patent medicines, make up the interior decoration of a cabin. Sometimes the walls are entirely papered with newspapers, which are more eagerly sought for this purpose than for their literary contents. Material for exterior decoration is more accessible to the mountain housewife, and hence we find, where her work-burdened life will permit, that she has done all she can for her front yard. Poppies, phlox, hollyhock, altheas, and dahlias lift their many-coloured blooms above the rail fence. Over the porch, where there is one, climb morning-glory, sweet potato vines, and wild mountain ivy; and from the edge of the roof are suspended home-made hanging baskets, contrived from old tin cans, buckets, or anything that will hold soil, and filled with the various ferns and creepers which the forests furnish in great beauty and abundance.

A vegetable garden is always to be found at the side or rear of the cabin. This is never large, even for a big family. It is ploughed in the spring by the man of the household, and enriched by manure from the barn, being the only part of the whole farm to receive any fertilizer. Any subsequent ploughing and all weeding and cultivation of the vegetables is done by the women. The average mountain garden will yield potatoes, beets, cabbages, onions, pumpkins, and tomatoes of dwarf size. Beans are raised in considerable quantities and dried for winter use. The provisions for the luxuries of life are few. Adjoining every garden is a small patch of tobacco, which is raised only for home consumption. It is consumed, moreover, by

both sexes, old and young, and particularly by the woman, who both smoke and "dip" snuff, making the brush for the dipping from the twig of the althea. In a large gathering like a funeral, one can often see girls from twelve to fourteen years old smoking their clay or corn-cob pipes. A young woman who went through the mountains last summer to study the conditions for a social settlement there, found the children at a district school amusing themselves by trying to see who could spit tobacco-juice nearest a certain mark on the school-house wall, the teacher standing by and watching the proceeding with interest.

Sugar is never seen in this district, but backwoods substitutes for it abound. Almost every cabin has its beehives, and anywhere from ten to twenty. The hives are made from hollowed-out sections of the bee-gum tree, covered with a square board, which is kept in place by a large stone. The bees feed in the early spring on the blossoms of the yellow poplar, but in the western counties, where this tree is rapidly being cut out of the forest for lumber, honey is no longer so abundant. But the mountain region, as a whole produces large amounts of honey and wax. Pike County, on the Virginia border, produced over 60,000 lbs. of honey in 1890. Maple sugar is gotten in considerable quantities from the sugar maple, which abounds. As one rides through the forests, he sees here and there the rough little log troughs at the base of these trees, the bit of cane run into the hole bored through the bark for the sap, and at long intervals a log sugar-house with its huge cauldron for reducing the syrup. Maple sugar is used only as a sweetmeat. The mountaineer put his main reliance for sweetening on sorghum molasses, which he makes from the sorghum cane. Two acres of this will provide an average mountain household with sorghum molasses, or "long sweetening," for a year. They eat it with their "pone" bread and beans; coffee thus sweetened they drink with relish, though to the palate of the uninitiated it is a dose. Sugar, or "short sweetening," is a rarity.

Conditions point to agriculture as the only means for the Kentucky mountaineer to gain a livelihood. Mineral wealth exists in abundance in this section, but the lack of transportation facilities prevents its exploitation; so the rough hillsides must be converted into field and pasture. The mountaineer holds his land in fee simple, or by squatter claim. This is based, not upon title, but merely on the right of possession, which is regarded, moreover, as a thoroughly valid tenure in a country which still preserves its frontier character. Large

tracts of Kentucky mountain lands are owned by persons outside the state, by purchase or inheritance of original pioneer patents, and these are waiting for the railroads to come into the country, when they hope to realize on the timber and mines. In the mean time the mountaineers have been squatting on the territory for years, clearing the forests, selling the timber, and this with conscious impunity, for interference with them is dangerous in the extreme. Every lawyer from the outside world who comes up here to a county courthouse to examine titles to the land about, keeps his mission as secret as possible, and having accomplished it, leaves the town immediately. If further investigation is necessary, he does not find it safe to return himself, but sends a substitute who will not be recognized.

The pioneer character of the region is still evident in the size of the land-holdings. In the most mountainous parts near the eastern border-line the farms average from 160 to 320 acres; in the western part of the plateau, from 100 to 160 acres. Of the whole state, the mountain counties show by far the largest proportion of farms of 1000 acres and over. Pike County has sixty-six such. Mountaineers in two different sections told us that the land on the small side creeks was better, and there farms averaged about 200 acres; but that on main streams, like the North Fork of the Kentucky River and Poor Fork of the Cumberland, the farms were usually 600 acres, because the soil was poorer. The cause for this was not apparent, unless it was due to exhaustion of soil from long tilling, as the valleys of the main streams, being more accessible, were probably the earliest settled.

Only from thirteen to thirty per cent. of the acreage of the farms is improved; the rest is in forest or pasture. Land is cleared for cultivation in the old Indian method by "girdling" or "deadening" the trees, and the first crop is planted amidst the still standing skeletons of ancient giants of the forests. Indian corn is the chief crop raised, and furnished the main food-supply for man and beast. Great fields of it cover the steep mountain sides to the very top, except where a farmer, less energetic or more intelligent than his fellows, has left a crown of timber on the summit to diminish the evil of washing. The soil on the slopes is thin, and in the narrow V-shaped valleys there is almost no opportunity for the accumulation of alluvial soil. Hence the yield of corn is only from ten to twelve bushels to an acre, only one-third that in the rich Bluegrass lands of Central Kentucky. But population is so sparse that the harvest generally averages forty bushels *per capita*. In the "up-

right" farms all ploughing is done horizontally around the face of the mountain, but even then the damage from washing is very great, especially as the staple crop forms no network of roots to hold the soil and requires repeated ploughing. In consequence, after two successive crops of corn the hillside is often quite denuded, the soil having been washed away from the underlying rocks. The field then reverts to a state of nature, growing up in weeds and briars, and furnishing a scanty pasturage for cattle. Level land is very scarce, and is to be found only in the long serpentines of the main streams; but even here, from long cultivation and lack of fertilizers, a field is exhausted by two crops, and has to "rest" every third year. Clover is almost never seen. The mountaineers maintain it will not grow here, although on our circuit we did see two fields.

Of other cereals beside corn the yield is very small. Some oats are raised; but rye, wheat, barley, and buckwheat are only occasionally found. One or two rows of broom-corn provide each cabin with its material for brooms. Sometimes a small quantity of hay, poor in quality, is cut from a fallow-field for winter use. The yield in all the crops is small, because the method of agriculture employed is essentially extensive. The labour applied is small, limited to what is possible for a man and his family, generally, too, the feminine part of it, because his sons found their own families at an early age. It is almost impossible to hire extra labourers, because this element of the population, small at best, finds more profitable and steadier employment in various forms of lumber industry. The agricultural implements used are few, and in general very simple, except in the vicinity of the railroad. In remote districts the "bull-tongue" plough is in vogue. This primitive implement is hardly more than a sharpened stick with a metal rim; but as the foot is very narrow, it slips between the numerous rocks in the soil, and is therefore adapted to the conditions. Natives in two different sections told us that "folks fur back in the mountains" resort to something still simpler—a plough which is nothing but a fork of a tree, the long arm forming the beam, and the shorter one the foot.

The mountains of Kentucky, like other upland regions, are better adapted to stock farming; but, as the native has not yet learned the wisdom of putting his hillside in grass to prevent washing, and at the same time to provide pasturage, the stock wanders at will in the "range" or forest. There sheep thrive best. They feed on the peavine, which grows wild in the dense woods, but will not grow on cultivated land. One native explained that the sheep liked the

"range," because they could take refuge from winter storms and the intense noonday heat of summer in "the stone houses." In answer to the inquiry whether he constructed such houses, he answered with the characteristic reverence of the mountaineer, "No; God made 'em. They're God's houses—just caves or shelter places under ledges of rock." About half of the mountain sheep are Merino and English breeds, but they have deteriorated under the rough conditions obtaining there. While the average yield per fleece for the whole state of Kentucky is over 4 lbs. of wool, for the mountain counties it is only 2 lbs., and in some localities drops to 1½ lb. These sheep are naturally a hardy stock, and are often bought up by farmers from the lowlands, taken down to the Bluegrass and fattened for a few months, and sold at a profit.

Sheep are the only product of the mountain farm that can find their way to an outside market and do not suffer from the prevailing lack of means of transportation. In regard to everything else, the effort of the native farmer is paralyzed by the want of a market. If he fattens his hogs with his superfluous corn, they are unfit to carry their own weight over the 40 or 50 miles of rough roads to the nearest railroad, or they arrive in an emaciated condition. So he contents himself with his "razor-back" pigs, which climb the hills with the activity of goats and feed with the turkeys on the abundant mast in the forests. Cattle also are raised only for home use. Steers are used pretty generally for ploughing, and especially for hauling logs. Every cabin has one cow, occasionally more. These can be seen anywhere browsing along the edge of the road, where the clearing has encouraged the grass. In the late summer they feed greedily on "crap grass," or Japan clover (*Lespedeza striata*), which springs up wherever there is a patch of sunlight in the forest. Knowing that dairy products are natural staples in almost all mountain countries of the world, as we penetrated into this district we made constant inquiries in regard to cheese, but everywhere found it conspicuous by its absence. However, on our returning to civilization, the census reports on mountain industries revealed the surprising fact that just one county, in the southwestern part of the district and on the railroad, was cheese-producing, and that it made 6374 lbs. in 1889. The mystery was explained on referring to the statistics of population, which showed that this county harboured a Swiss colony of 600 souls. In the state of West Virginia, also, where the topography of the country is a repetition of that of eastern Kentucky, no cheese is produced; but, on the other hand, considerable quantities are made

in all the mountain counties of Tennessee and Virginia. These states, again, are alike in having, as their geographical structure, the broader inter-montane valleys between the chain-like linear ranges of the Great Appalachian depression. In 1889, Lee County, Virginia, produced 8595 lbs. of cheese; while just over Cumberland Mountain, which forms its western border, Bell County, Kentucky, produced not an ounce.

In spite of the hard conditions of life, the Kentucky mountaineer is attached to this rough country of his. Comparatively few emigrate, and many of them come back, either from love of the mountains or because the seclusion of their previous environment has unfitted them to cope with the rush and enterprise of life in the lowlands. One mountaineer told us that, though it was a poor country, "the men mostly stays here." Another who had travelled much through the district in his occupation of selecting white oak timber for a lumber company, estimated that about one man in five emigrated; such generally go to Missouri, Arkansas, and Texas. We met several who had been out West, but the mountains had drawn them back home again. The large majority of the population, therefore, stay in their own valley, or "cove," as they call it, divide up the farm, and live on smaller and smaller estates, while the corn-fields creep steadily up the mountains. The population of these twenty-eight counties with their 10,000 square miles area was about 220,000 in 1880, or over twenty to the square mile; that in 1890 was 270,000, showing an increase of 25 per cent. As the ratio in the past decade has risen, there is now a population of 340,000, or thirty-four to the square mile, while for the state at large the ratio is fifty-four. This growth of population is to be attributed almost entirely to natural increase; and as the accessions from the outside are practically limited to the foreign element, only two or three thousand all told, employed in the coal-mines and on the railroads, so large a percentage of increase precludes the possibility of much emigration. Cities there are none, and the villages are few, small, and wretched. This is true also of the county-seats, which in the interior counties average only from 300 to 400 souls; while those of the marginal counties and located on railroads encircling the mountain districts sometimes rise to 1500, but this is rare.

In consequence of his remoteness from a market, the industries of the mountaineer are limited. Nature holds him in a vise here. As we have seen, a few of his sheep may find their way to the railroad, but his hogs are debarred by the mountains from becoming articles



of commerce. The same is true of his corn, which is his only superabundant crop; and this, therefore, by a natural economic law, the mountaineer is led to convert into a form having less bulk and greater value. He makes moonshine whisky, and not all the revenue officers of the country have succeeded in suppressing this industry. At our first camping-place, only 15 miles from the railroad, we were told there were twenty illicit stills within a radius of 5 miles. Two women, moreover, were pointed out to us who carried on the forbidden industry; their husbands had been killed in feuds, so they continued to operate the stills to support their families. Living so far from the arm of the law, the mountaineer assumes with characteristic independence that he has a right to utilize his raw material as he finds expedient. He thinks it laudable to evade the law—an opinion which is shared by his fellows, who are ready to aid and abet him. He therefore sets up his still in some remote gorge, overhung by trees and thickly grown with underbrush, or in some cave whose entrance is effectually screened by boulders or the dense growth of the forest, and makes his moonshine whisky, while he leaves a brother or partner on guard outside to give warning if revenue officers attempt a raid. It is a brave man who will serve as deputy marshal in one of these mountain counties, for raiding a still means a battle, and the mountaineers, like all backwoodsmen, are fine marksmen. In Breathitt County, called "Bloody Breathitt," four deputy marshals have been killed in the past six months. The moonshiner fully understands the penalty for illicit distilling, and if he is caught, he takes his punishment like a philosopher—all the more as there is no opprobrium attached in his community to a term in the penitentiary for this crime. The disgrace falls upon the one who gave testimony against the illicit distiller; and often a mountaineer, if summoned as a witness in such a case, leaves his county till the trial is over, rather than appear for the prosecution. Most of the moonshine is sold within the mountains. The natives, physically depressed by lack of nourishment and by the prevalent diseases of the district, crave stimulants; so the demand for spirits is steady. Not content with the already excessive strength of moonshine whisky, they often add pepper or wood-ashes to make it more fiery. The result is maddened brains when under its influence, and eventually ruined constitutions.

Forests of magnificent timber cover the Kentucky mountains, and supply the only industry which brings any considerable money from the outside world, because the only one which can utilize the small,

rapid streams for transportation. The steep-sided valleys are productive of valuable hardwood timber. Many varieties of oak, walnut, poplar, chestnut, maple, ash, and tulip trees grow to magnificent size. Log-rolling begins in the fall after the Indian corn harvest, and continues through the winter till March. The logs are deposited along the banks of the streams to wait till a "tide" or sudden rise supplies enough water to move them. Sometimes, where a creek or "branch" is too small to carry its prospective burden, the loggers build across it a "splash dam," behind which logs and water accumulate to the requisite point, and then the barrier is knocked loose, when tide and timber go rushing down the channel. On the main streams of the Kentucky, Big Sandy, Licking, and Cumberland, the logs are rafted and floated down to the saw-mills in the lowlands. All the headwaters of these rivers are marked out to the traveller through the mountains by the lumber stranded from the last "tide" and strewn along their banks.

Some of the wood within a day's hauling of the railway is worked up in a form ready for commerce, but generally with great waste of good material. The fine chestnut oaks are cut down in large quantities simply to peel off tan-bark, while the lumber is left to rot. Railroad ties are cut and shaped in the mountains from the oak and hauled to the railroad. The making of staves of white oak for whisky-barrels is also a considerable industry. The trees are sawed across the length of the stave, and split by wedges into billets, which are then hollowed out and trimmed into shape. This last process is performed by an implement run sometimes by steam, generally by horse-power, for in the latter form it is more readily transported over the rough mountain roads from place to place, as the supply of white oak is exhausted. These staves bring \$32.00 a thousand delivered at the railroad. The mountain labourer working at stave-making or at the portable saw-mills earns 75 cents a day, while the usual wages for farm hands in this district are only 50 cents.

The trades in the mountains are the primitive ones of a pioneer community—cobbler, blacksmith, and miller; but even these elemental industries have not been everywhere differentiated. Many a cabin has its own hand-mill for grinding corn when the water-mill is too remote. Many a native still makes moccasins of calf or raccoon skin for himself and his family to spare the more expensive shoes; and it is a poor sort of mountaineer who cannot and does not shoe his own horses and steers. Here is reproduced the independence of the pioneer home. Spinning and weaving survive as an industry

of the women. In some few localities one can still see the flax in every stage, from the green growth in the field to the finished home-spun in 100-yard pieces; or, again, one sees a cotton patch in the garden, a simple primitive gin of home invention for separating the fibre, and understands the origin of the cotton thread in the linsey-woolsey cloth of domestic manufacture which furnishes the dresses for women and children. Cotton and flax spinning, however, have died out greatly during the past few years, since the introduction of cheap cotton goods into the mountain districts. Spinning of woollen yarn for stockings is still universal, with the concomitant arts of carding and dyeing; while the weaving of linsey-woolsey for clothes or blankets is an accomplishment of almost every mountain woman. One native housewife showed us her store of blankets, woven by her mother and herself. They were made in intricate plaids of original design and combination of colour, and the owner told us she worked without a pattern and without counting the threads, trusting to her eye for accuracy. Many of the dyes, too, she made herself from certain trees, though a few she bought at the country store. The home-woven counterpanes are very interesting, because the designs for these have been handed down from generation to generation, and are the same that the Pilgrim Fathers brought over to New England. But the mountain woman puts forth her best taste and greatest energy in making quilts. In travelling through this section one looks out for some expression of the æsthetic feeling as one finds it in the wood-carving of the Alps and Scandinavian mountains, the metal-work of the Caucasus, the Cashmere shawls of the Himalayas, and the beautiful blankets of the Chilcat Indians. Gradually it is borne in upon him that quilt-making amounts to a passion among the women of the Kentucky mountains; that it does not merely answer a physical need, but is a mode of expression for their artistic sense; and there is something pathetic in the thought. They buy the calico for the purpose, and make their patchwork in very intricate designs, apparently getting their hints from their own flower-gardens; at any rate, the colours in certain common garden flowers were reproduced in some quilts we saw, and the effect was daring but artistic. Quilt-making fills the long leisure hours of the winter, and the result shows on the open shelves or cupboard which occupies a corner in every house. Passing a one-room cabin on the headwaters of the Kentucky River, we counted seventeen quilts sunning out on the fence.

The only work of the women which brings money into the

family treasury is searching for ginseng, or "sang-pickin'," as the mountaineer calls it. This root is found now only in the wildest, most inaccessible ravines; but the women go out on their search barefoot amid the thick brush and briars, taking their dogs along to keep off the rattlesnakes. They also gather "yellow root" (*Hydrastis canadensis*), which with the ginseng (*Panax quinquefolium*) they dry and then barter for produce at the nearest store, the former at the rate of 40 cents per pound, the latter at three dollars. Most of the trade in the mountains is barter, for money is as scarce as in genuine pioneer countries, and the people are accordingly unfamiliar with it. A native who came over the mountains from some remote cove to sell eggs to a camping party this past summer, was offered a dollar bill for his produce, but refused to accept it, as he had never seen one before, his experience having been limited to silver dollars and small change. At another place we found that the people were reluctant to take the paper currency of the issue of 1892, anything so recent having not yet penetrated into their fastnesses. But the lack of money does not prevent them from being eager traders, especially in horseflesh. One of the attractions of Sunday church-going to the men is the opportunity it offers for this purpose. A glance at one of these little mountain churches when meeting is going on reveals the fitness of the occasion. The people have gathered from every direction for miles around; they have come on their best horses and now every tree on the edge of the clearing has become a hitching-post. Groups form outside before and after the service, satisfying their social craving, and, with the few topics of conversation at their command, talk naturally drifts upon the subject of their "beasties," with the inevitable result of some trading. Their trading propensity carries them so far that they often trade farms as they would horses, no deeds being executed.

As the isolation of his environment has left its stamp upon every phase of the outer life of the mountaineer, so it has laid its impress deep upon his inner nature. The remoteness of their scattered dwellings from each other and from the big world beyond the natural barriers, and the necessary self-reliance of their pioneer-like existence, has bred in them an intense spirit of independence which shows itself in many ways. It shows itself in their calm ignoring of the revenue laws, and in their adherence to the principle of the blood-feud which inculcates the duty of personal vengeance for a wrong. In consequence of this spirit of independence, and of its

antecedent cause in their slight dealings with men, our Kentucky mountaineers have only a semi-developed commercial conscience. They do not appreciate the full moral force of a contract; on this point they have the same vague ideas that many women have, and from the same cause. At all times very restive under orders, when they have taken employment under a superior, their service must be politely requested, not demanded. If offended, they throw up their job in a moment, and go off regardless of their contract and of the inconvenience they may occasion their employer. Every man is accustomed to be his own master, to do his own work in his own way and his own time. And this brings us to another curious characteristic of the mountaineer, also an effect of his isolation. He has little sense of the value of time. If he promises to do a certain thing on a certain date, his conscience is quite satisfied if he does it within three or four days after the appointed time. For instance, some mountaineers had promised to furnish horses for our camping party, which was to start from a certain village on July 15; when that day came half a dozen horses had failed to appear, but their places were supplied and the party moved off. During the succeeding week, delinquent mountaineers dribbled into town with their horses, and were surprised to find they were too late, explaining that they did not think a few days would make any difference.

Living so far from the rush of the world, these highlanders have in their manner the repose of the eternal hills. In the presence of strangers they are quite free from self-consciousness, and never lose their simplicity or directness. There is no veneer about these men; they say exactly what they think, and they think vigorously and shrewdly. Endowed with the keen powers of observation of the woodsman, and cut off from books, they are led to search themselves for the explanation of phenomena or the solution of problems. Though hampered by ignorance, their intellects are natively strong and acute. Conscious of their natural ability, conscious too that they are behind the times, these people are painfully sensitive to criticism. Cut off so long and so completely, they have never been able to compare themselves with others, and now they find comparison odious. They resent the coming of "furriners" among them, on the ground that outsiders come to spy upon them and criticize, and "tell-tale," as they put it, unless they are convinced that it is some commercial mission or a political campaign that brings the stranger. His suspicions allayed, the mountaineer is the most generous host in the world. "Strangers, won't you light and

set? Hitch your beasties. This is a rough country, and I'm a poor man, but you can have all I've got." This is the usual greeting. If it is a question of spending the night, the host and his wife sleep on the floor and give the guests the bed. In a one-room cabin, the entertainment of strangers involves inconvenience, but this discomfort is never considered by the Kentucky highlander. When he says, "You can have everything I've got," this is no lip-service. At one cabin where we spent the night, when we were making our toilettes in the morning, the daughter of the house, with infinite grace and simplicity, offered us the family comb and her own toothbrush. Hospitality can go no further. This quality the Kentucky mountaineer has in common with the inhabitants of all remote, untrodden regions where inns are rare. But if he refuses to be reimbursed for his outlay and trouble, he is repaid in part by the news which the stranger brings, and the guest is expected to be very communicative. He must tell everything he has seen or heard on his journey through the mountains, and must meet a whole volley of questions of a strictly personal nature. Inquiries come as to his age, married or unmarried condition and the wherefore, his health, ailments, symptoms, and remedies.

The mountaineer has a circumscribed horizon of interests; he is little stirred by the great issues of the day, except those of a political nature, and for politics he has a passion. A discussion of party platforms or rival candidates for office will at any time enthral him, keep him away for a whole day from the spring ploughing or sowing. As we have explained, the mountains presented conditions for agriculture as little adapted for a slave industrial system as did those of New England. Hence, when the conflict of the systems of the North and of the South came to an issue in the Civil War, the mountain sections of the Southern States took the side of New England, and went over almost bodily into the Republican party. Such was their zeal for the Union, that some of the mountain counties of Kentucky contributed a larger quota of troops, in proportion to their population, for the Federal army than any other counties in the Union. The enthusiasm of those days survives in that section to-day in their staunch adherence to the Republican party. The spirit has been encouraged also by the fact that topography has defined the mountain section as one of the political divisions of the State by a kind of common law of both political parties in their conventions and in common parlance. Although more sparsely populated than any of the others, the mountain division, from its greater



local unity, is relatively much stronger in party conventions, since its delegate vote is more likely to be a unit. In consequence of this fact, it is sure to get a fair proportion of its men as candidates upon the State ticket, and its party vote can be counted upon with considerable accuracy. Knowing, therefore, that they are a strong factor in the politics of the State, it is not surprising that the Kentucky mountaineers should find therein a great interest.

Men who, from the isolation of their environment, receive few impressions, are likely to retain these impressions in indelible outline; time neither modifies nor obliterates them. Thus it is with the Kentucky mountaineer. He never forgets either a slight or a kindness. He is a good lover and a good hater; his emotions are strong, his passions few but irresistible; because his feelings lack a variety of objects on which to expend themselves, they pour their full tide into one or two channels and cut these channels deep. Like all mountain-dwellers, they love their home. They love the established order of things. Their remoteness from the world's great current of new ideas has bred in them an intense conservatism, often amounting to bitter intolerance. For instance, they were so outraged by the divided skirts and cross-saddle riding of some of the women of our party, that in one county they were on the point of blocking our way; in another, they were only dissuaded from a raid on the camp by a plea from a leading man of the town for the two Kentucky women of the party who used side-saddles, and everywhere they gave scowling evidence of disapproval. There were no jeers; the matter was to them too serious for banter or ridicule. Nor was their feeling, as we shall see later, an outgrowth of a particularly high and delicate standard of womanhood; it was more a deep-seated dislike of the unusual. Painfully lax in many questions of morals, they hold tenaciously to matters of form. The women who came into our camp at different times to visit us, in spite of a temperature of 90° Fahr., wore red woollen mitts, their tribute to the conventions.

The upland regions of all countries are the stronghold of religious faiths, because the conservatism there bred holds to the orthodox, while the impressive beauty and grandeur of the natural surroundings appeals to the spiritual in man. Such a religion, however, is likely to be elemental in character—intense as to feeling, tenacious of dogma, but exercising little or no influence on the morals of everyday life. This is the religion of the Kentucky mountaineer. By nature he is reverential. Caves are "God's houses," sun time is

"God's time," indicated by the noon-mark traced with charcoal on the cabin door. A God-fearing man has the unlimited respect of every one in the mountains. A preacher is a privileged person. Wherever he goes he finds free board and lodging for himself and his horse, and his horse is always shod free. In that lawless country, a man who shoots a preacher is ever after an object of aversion, and there is a general assumption that the murderer will not live long—either a superstition or a generalization from the experience that often some individual constitutes himself an arm of the Almighty to punish the offender. One who is a preacher must be "called" to the work, and must serve without pay. The "call" does not presuppose any previous preparation for the profession, and naturally involves some modern substitute for Paul's tent-making to earn a livelihood. The result in the Kentucky mountains is sometimes amazing. Preachers there have been known to be whisky distillers. Some have been seen to take one or two drinks of liquor while delivering a sermon. We attended an outdoor "meetin'" conducted by one whose widowed sister ran a moonshine still. The best are farmers or country storekeepers. All are more or less ignorant, some densely so. We heard one man preach who could neither read nor write. At a meeting of some sectarian association in the fall of 1898, a mountain preacher advanced the opinion that the old blueback spelling-book gave all the education that a preacher needed. The style of preaching that appeals to the mountaineer is purely hortatory. It begins in a natural tone of voice, but, like all highly emotional speech, soon rises to rhythmical cadences, and then settles to a sustained chant for an hour or more. Any explanatory remarks are inserted parenthetically in a natural voice. This, and only this, stirs the religious fervour of the mountaineer. A clergyman from one of our cities who was doing missionary work among these people was met with the criticism after his service, "Stranger, I 'lowed to hear ye preach, and ye jest talked."

Though his religion is emotional and little suggestive of a basis in rationalism, yet the mountaineer takes his mental gymnastics in vigorous discussion of dogma. This seems to be the one form of abstract reasoning open to him—an exercise natural to the Teutonic mind. He is ignorant, remember, therefore positive and prone to distinguish many shades of belief. Sects are numerous. There are four recognized kinds of Baptists in the mountains. Denominational prejudice is so strong that each denomination refuses to have anything to do with another. A Methodist refuses to send

his children to the Presbyterian mission school in his neighborhood, though it is far superior to anything else at his command, and costs him nothing. For this reason the work of the various Home Mission boards in the mountains has achieved only limited results as to number. Only undenominational work, like that of a social settlement, can reach all the people of one locality; and in view of the sparsity of the population, this is a vital matter.

In spite of the intensity of religious feeling, the number of communicants of all denominations forms only from five to fifteen per cent. of the total population. The mountains of Eastern Kentucky show the largest area of this low percentage in the United States, east of the Missouri River and the Indian Territory. It may be due to the lack of churches and of any church organization where the preachers are "called" and do not form a distinct profession. Baptists, Disciples of Christ, and Methodists are most profusely represented. The sparsity of population with the diversity of sects permits religious service only once a month, when the circuit rider comes. This devoted man leaves his farm or store on Friday, and goes "creeter-back" over the mountains to each of his distant charges in turn. The district school building, in lieu of a church, answers for the meeting. Service is held on Saturday morning, and again on Sunday, for many of the congregation have come such a distance they feel entitled to a double feast of religion. They stay at the nearest cabin, which takes them in with their horses. After the Saturday sermon, the secular affairs of the church are attended to, as the mountaineer considers it unseemly to transact any business, even the disciplining of a delinquent member, on Sunday, although outside the sacred precincts he trades horses and indulges his taste for conviviality. Religion is something to be kept assiduously apart from common everyday living.

The fact that the profession of a mountain preacher is only an avocation with its consequent secondary claim upon his time, the fact of the severity of winter weather for horseback travel, and of the impassability of the roads at this season both for pastor and people, render church worship intermittent in this upland region, and at the same time explain the curious custom of the mountain funeral. This never takes place at the time of interment, but is postponed for months or years. It is desirable to have the ceremony at a time when the roads are passable, when the preacher will not be detained by the harvesting of his corn crop, and when there can be a great gathering of kinfolk, for the clan instinct is strong

among these people, and a funeral has its cheerful side in the opportunity of social intercourse it affords. Sometimes a long arrear of funerals has to be observed, if adverse circumstances for several years have prevented a family gathering. At one cabin we visited, the woman of the house told us she was getting ready for a big gathering at her place on the first of October, when the funerals of five of her relatives were to be preached. A university man, traveling through the mountains to make some scientific research, told us he had recently heard a sermon preached in honor of an old man who had died a year before and of a baby girl who had departed this life in 1868. The prominence given to funeral sermons in the season of good roads lends a sombre cast to the religion of the mountaineer, and strengthens in him a fatalistic tendency which is already one of his prominent characteristics, born doubtless of the hopelessness of his struggle with natural conditions. This feeling is so strong that it goes to astonishing lengths. It frankly condemns missions and Sunday schools as gratuitous meddling with the affairs of Providence. An Episcopal bishop recently, on arriving in a mountain village, heard that one of the families there was in great distress, and went immediately to make a visit of condolence. When he inquired as to the cause of their grief, he learned that a ten-year-old son had disappeared the evening before, and they had reason to suppose he had been lost in a large limestone cave which ran back two miles under the mountain not far away. In answer to his question if their search had been fruitless, he learned they had made no attempt at search, but "if he's to die, he's to die" came the wail, with pious ejaculations as to the will of God. In a few moments the man of God was striding along the trail to the cave, a posse of men and boys armed with candles and lanterns pressing close upon his heels, and in two hours the lost child was restored to the bosom of its family.

The morals of the mountain people lend strong evidence for the development theory of ethics. Their moral principles are a direct product of their environment, and are quite divorced from their religion, which is an imported product. The same conditions that have kept the ethnic type pure have kept the social phenomena primitive, with their natural concomitants of primitive ethics and primitive methods of social control. Such conditions have fostered the survival of the blood-feud among the Kentucky mountaineers. As an institution, it can be traced back to the idea of clan responsibility which held among their Anglo-Saxon forefathers; and it is

this Old World spirit which animates them when the eldest man of a family considers it a point of honor to avenge a wrong done to one of his kindred, or when a woman lays upon her sons the sacred obligation of killing the murderer of their father. In a community that grows from within by natural increase, hereditary instincts are strong, and clan traditions hold sway. But if the blood-feud was decadent among the colonial ancestors of our Kentucky mountaineers, the isolation of this wild upland region was all-sufficient to effect its renaissance, and to-day in some counties it is a more powerful factor of social control than the courts of law. The mountains, by reason of their inaccessibility and the sparsity of their populations, saw a great prolongation of pioneer days and pioneer organization of society, where every man depended on his own strong arm or rifle to guard his interests and right his wrongs. When the law invaded this remote region, it found the feud established and the individual loath to subordinate himself to the body politic. This individual was justified to himself by the almost universal miscarriage of justice. For the administration of the law is almost impossible in a feud case. It is next to impossible to convict a murderer in his own county, because the jury, and often the witnesses, are intimidated by the party of the defendant, and will fail to render a verdict of guilty; or, if the murder was committed to avenge some real wrong, the mountain jury, trained by tradition in their peculiar ideas of family honor, feels itself in sympathy with the criminal and acquits him. This they do without compunction, for they have as yet only a rudimentary conception of the sacredness of the law. The court often tries a change of venue, but the cost of this is particularly burdensome in a poor community, and the change is made to an adjoining county, where sympathy with mountain methods still holds. As a last resort, a rescue party of the defendant's relatives will make its attempt to defeat justice. An episode of the Howard and Baker feud, which raged during the summer of 1899 in Clay County, was the trial in Knox County of a Baker lad who had killed one of the opposing faction. Forty-two Bakers, armed with rifles and smokeless powder, came over the mountains to attend the trial, and openly established their "fort," or headquarters, in the county-seat. The boy, though clearly guilty, was acquitted, received his gun from the sheriff, and started off that night to the scene of hostilities, attended by his kindred as a guard of honor, not as a rescue party. The consequence is, if a man is killed in a quarrel, his relatives, knowing from long experience the helplessness of

the law, take the matter of punishment into their own hands, and at their first chance shoot the murderer. But the desire for personal vengeance is always present. In this same Howard and Baker feud, Tom Baker shot to death William White, an ally of the Howards and brother of the sheriff, as likewise kinsman of the county clerk, jailer, and judge. Naturally reluctant to give himself up to officials who were his personal enemies, Baker took to the hills until State troops were sent to the county, when he gave himself up to them. They pitched tent in the court-house yard, with a Gatling gun in position for action, and Tom Baker was placed in a tent in the centre, while no one was allowed to enter the military lines. But one day his guards brought Tom Baker for a moment to the door of his tent for a breath of air, and in that instant a shot, fired from the house of the sheriff, found its way to his heart. And the mountaineers openly exulted that a hundred trained soldiers could not protect a man who had been marked out as a victim.

The exciting causes of these feuds are manifold and often of a trifling nature. A misunderstanding in a horse trade, a gate left open and trespassing cattle, the shooting of a dog, political rivalry, or a difficulty over a boundary fence may start the trouble. The first shooting is sometimes done in the madness of moonshine intoxication. These mountaineers are men who hold life as light as a laugh, and to such anything is sufficient provocation to shoot; so the first blood is easily shed. The feud once started, a long and bloody war ensues, often for several years, in which waylaying, shooting from ambush, and arson are regular features. Sometimes pitched battles, engaging a hundred men or more, or a protracted siege of a factionist stronghold varies the programme. In the recent Howard and Baker feud, the principals were men of prominence, influence, and means, so they were able to command a number of followers. The main allies of the Howards were the White family, who have furnished members of the United States Congress, State Senate, and House of Representatives, and have controlled the offices of the county for fifty years. In the French and Eversole feud, which raged at intervals for many years in Perry County, the best people of the county were drawn into one or the other faction. And yet throughout this section there are those who deplore the reigning lawlessness.

In all mountain regions of the world crimes against persons are far more frequent than crimes against property. So in the Kentucky uplands the former are frequent, the latter rare. There is no



real disgrace attached to killing an enemy or a government officer who attempts to raid a moonshine still. There is little regard for the law as such, little regard for human life; but property is sacred. If a mountaineer is asked what, in the eyes of the mountain people, is the worst crime a man can commit, the answer comes, "Horse-stealing. If a man up here steals a horse, his best friend would not trust him again with fifty cents." Here speaks the utilitarian basis of his ethics in the almost impassable roads and trails of a pioneer country. To further inquiry he replies, "And the next worst thing is to steal logs out of a stream—indeed, to steal anything." The mountaineer is honest, scrupulously so. If a log from a lumber-camp is stranded on his field from a subsiding flood in the river, he rolls it into the water at the next rise; or if this is impossible on account of its weight, he lets it lie and rot as a matter of course, for it never occurs to him to cut it up for his own use. He never locks his door. If a robbery occurs, the punishment is swift and sure, for the hue-and-cry is raised up and down the valley or cove, and the escape of the culprit is almost impossible. Primitive in their shortcomings, these mountain people are primitive also in their virtues. The survival of the clan instinct has bred in them a high degree of loyalty; and their free, wild life, together with the remoteness of the law, has made them personally brave. They carry themselves with a certain conscious dignity which peremptorily forbids all condescension. Every man recognizes man's equality; there are no different classes. The consequence is the prevalence of that democratic spirit which characterizes the mountains of Switzerland and Norway.

In only one respect do the mountain people show marked moral degradation. There seems to be no higher standard of morality for the women than for the men, and for both it is low. This is true throughout the Southern Appalachians. The women are modest, gentle, and refined in their manners, but their virtue is frail. The idealism of youth generally keeps the girls pure, but when they marry and take up the heavy burdens that mountain life imposes upon them, their existence is sunk in a gross materialism, to which their environment offers no counteracting influence. Furthermore, the one-room cabin harbours old and young, married and single, of both sexes.

The Kentucky mountaineers are shut off from the inspiration to higher living that is found in the world of books. Isolation, poverty, sparsity of population, and impassability of roads make an education

difficult, if not impossible; the effect of these conditions is to be seen in the large percentage of illiterates in this section. Of the women over twenty-five years old and men over forty, 80 per cent. can neither read nor write. It is quite the usual thing to meet men of clear, vigorous intellects and marked capacity in practical affairs who cannot sign their own names. One mountaineer gave it as his observation that only one-half of the men over twenty years in his county could read. With the children it is somewhat better, because with the natural increase of population more district schools are established, and distances are therefore shortened for the tramp from cabin to school-house. To children who must go barefoot, or wear home-made moccasins, or who can afford not more than one pair of store shoes a year, the question of distances is a vital one, especially in the winter. The district schools are in session for five months, from August first till Christmas. The number of pupils at a school ranges from fifty to a hundred of all ages from six years to twenty, and all are in charge of one ignorant, often inexperienced teacher. They start in at their work in August, but it is soon interrupted for a week, because the instructor has to leave to attend the Teachers' Institute at the county-seat. On October first the older boys and girls are withdrawn from school for two weeks to help get in the harvest. Then November comes, and with it in alternative years certain important state and county elections. If the teacher is a man, being one of the few educated men of the section, he is probably a candidate for one of the county offices, or a member of his always numerous family connection aspires to the State legislature. In either event the teacher, with a mountaineer's sense of the importance of politics, closes school for ten days before the election in order to take part in the campaign. The middle of November the little flock reassembles, and the work of education goes on. But soon the fall rains come, and then the cold and snows of December. First the youngest and frailest are kept at home, but the older and sturdier ones continue, all the more eagerly now because they have the undivided attention of their instructor. The day comes, however, when the intense cold, combined with their own sad want of stout shoes and warm clothes, keeps even the most ambitious at home, and the teacher, with a sigh of relief or regret, locks the school-house door two weeks before the term is over. And the children, with no books at home on which to exercise their attainments, lose almost all that they have gained. And that all is little at best.

The district school of the Kentucky mountains is, in general, a rough log-cabin more or less crudely equipped according to the sparsity or density of the surrounding population. Some are entirely without desks, rude, uncomfortable benches of rough mountain manufacture taking their places. We saw no maps, and instead of blackboards, the unplanned planks of the inside of the walls had been stained a dark color for a space of 12 feet. In some of the back districts, where hardware is at a premium, the children are summoned from recess by a big wooden rattle. If the physical equipment of the school is primitive, the mental is almost as crude. The standard of education for the teachers is not high. Some of them have not progressed farther than the multiplication table in arithmetic, and all use ungrammatical English. Their preparation for teaching in general consists of the course of instruction at the district school and a few months' training at the so-called normal school of the county-seat. At a recent meeting of the Teachers' Institute in one of the mountain counties, when the subject up for discussion was "Devotional exercises in schools," it transpired that, of the fifty-six public school teachers present, only one in eight knew the Lord's prayer, a majority did not know what it was or where it came from, a majority did not own a Testament, and only two or three were the proud possessors of a Bible. Such ignorance is pitiable, but pitiable chiefly because it means lack of opportunity. Many of such teachers are half-grown boys and girls, who are in this way trying to earn the money, always so scarce in the mountains, "to go down to the settlements" and get an education. When their desire for knowledge is once aroused, they are strong, persistent, and ready to face any obstacle to get an education. Their vigorous minds, unjaded nerves, and hardened bodies combine to make them victors in the struggle. One boy of fourteen started out from his hillside home with his little bundle of clothes slung over his shoulder and 75 cents in his pocket, and tramped 25 miles over rough mountain trails to Berea, where the nearest school and college were. While taking the course there, he supported himself by regular jobs of various kinds, and maintained an excellent standing in his classes. When a mountain lad comes down to the State University at Lexington, it is a foregone conclusion that he is going to carry off the honors. We find at work in him the same forces that give success to the youth from the Swiss Alps and the glens of the Scotch Highlands, when these too come down into the plains to enter the fierce struggle for existence there. For the Kentucky

lad, the change has meant a stride over an intervening hundred and fifty years.

The life of the Kentucky mountaineer bears the stamp of the eighteenth century. His cabin home is rich in the local color of an age long past. The spinning-wheels for flax and wool, the bulky loom in the shed-room outside, the quaint coverlet on the beds within, the noon-mark on the door, and, more than all, the speech of the people, show how the current of time has swept by and left them in an eddy. The English they speak is that of the Elizabethan age. They say "buss" for kiss, "gorm" for muss, "pack" for carry, and "poke" for a small bag. Strong past tenses and perfect participles, like "help" and "holpen," and the syllabic plural of words ending in *st*, like "beasties," are constantly heard. The Saxon pronoun "hit" survives not only in the upland regions of Kentucky, but also of the Virginias, Carolinas, and Tennessee. With the conserving power of the mountains has come into operation also their differentiating influence within their boundaries. Every valley has some peculiarity of vocabulary or speech which distinguishes it from the community across the adjoining range. The mountaineers have, therefore, criticized the dialect in John Fox's stories of this region, because they are not judges of the dialect of any locality but their own. A similar region of retarding isolation and of Elizabethan English is found on Hatteras Island, which lies a hundred miles off the North Carolina coast, remote from the usual line of travel. It has preserved a vernacular speech which to-day needs a glossary to be intelligible, but which is fast conforming to the modern standard, since the recent introduction of daily mail boats.

Survivals of speech are accompanied also by survivals of customs. In the mountains, the "rule of the road" when two horsemen or wagons meet is to turn to the left, as in England. Another relic of old Scotch or English custom we find in the "infare" or "infair," after a mountain wedding. This is the dinner given at the home of the groom's parents the day after the ceremony. It was observed in the rural districts of all Kentucky and Indiana up till fifty years ago, but now is adhered to only in the mountains. A more remarkable case of survival was discovered in 1878 by Prof. Nathaniel S. Shaler, of Harvard, on the borders of Virginia and Kentucky. There in a secluded valley he found men hunting squirrels and rabbits with old English short-bows. "These were not the contrivance of boys or of to-day, but were made and strung, and

the arrows hefted in the ancient manner. The men, some of them old, were admirably skilled in their use; they assured me that, like their fathers before them, they had ever used the bow and arrow for small game, reserving the costly ammunition of the rifle for deer and bear."

Though these people came into the mountains with eighteenth-century civilization, their isolation and poverty not only prevented them from progressing, but also forced them to revert to earlier usages which at the time of their coming were obsolescent. This is the explanation of the feud, as has been shown above, of the use of the hand-mill and short-bow, and especially of the old English ballad poetry which constitutes the literature of these mountain folk to-day. This has survived, or, more properly, flourished in its mediæval vigor because it has not felt the competition of books. The scant baggage of the pioneer immigrants from colonial Virginia and Carolina could not allow much space for books, and the few that did make the trip across the Appalachian Mountains were used up, from much reading and handling, by one generation. Poverty and inaccessibility prevented an invasion of new books from without, and from within there was no competition from newspapers. There are to-day twenty contiguous mountain counties, covering altogether an area of 6,000 square miles, not one of which can boast a printing-press. Under these circumstances, the Kentucky mountaineer reverted to his ancestral type of literature and revived ballad poetry. This has now been handed down from lip to lip through generations, the slightly variant form and phrase only testifying to its genuineness. The ballad of "Barbara Allen," popular in Great Britain three hundred years ago, and known now in America only to the musical antiquarian, is a stand-by in several of the mountain counties. The tragic ballad of "Little Sir Hugh," or "The Jewish Lady," as it is variously called, traces back to the Prior's Tale of Chaucer. The lengthy ballad of "Lord Bateman," or "The Turkish Lady," shows unmistakable identity with the poem of the same name in Kurlock's "Ancient Scottish Ballads," though the Scotch version is longer.

Animated by the spirit of minstrelsy, the mountaineers have composed ballads on the analogy of the ancient. These are romantic or heroic and of narrative length. We heard a woman sing a native ballad of fifty-two stanzas, entitled "Beauregard and Zollicoffer," which recounted the deeds of these two generals of the Civil War. The music for all these ballads is in a weird minor key, and is sung

in a nasal tone. So far as we were able to judge, the women are the chief exponents of mountain minstrelsy, and the accuracy of their memories for these long poems is suggestive of Homeric days. Spain and Sicily are perhaps the only other parts of the civilized world, at least in Europe and America, where modern folk-songs are still composed in the form of ballad poetry.

The whole civilization of the Kentucky mountains is eloquent to the anthropogeographer of the influence of physical environment, for nowhere else in modern times has that progressive Anglo-Saxon race been so long and so completely subjected to retarding conditions; and at no other time could the ensuing result present so startling a contrast to the achievement of the same race elsewhere as in this progressive twentieth century.

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### THE INFLUENCE OF THE PRECIOUS METALS ON AMERICAN EXPLORATION, DISCOVERY, CONQUEST AND POSSESSION\*

BY

GEORGE D. HUBBARD, Ph.D.†

EARLY EXPLORATIONS AND DISCOVERIES. Beginning with the first explorer who sailed across the Atlantic, "the expectation of finding a land rich in treasures of gold and silver or in products easily sold for the metals was the prevailing motive in the minds of most of the early discoverers and explorers." Whitney says‡ the sixteenth century travelers had little else in mind save the recompense for their toils and dangers in the rich mines of the precious metals which they were going to discover. Thus exploration was prompted by the desire for gold or for the lucrative trade in gold and spices from the Orient. The news of immensely rich empires, and mines of gold and silver ceaselessly attracted Spanish exploration and conquest into new quarters and thereby the more rapidly and extensively opened up the New World to the knowledge of mankind. The

\* This paper is a portion of a thesis presented as a part of the requirements for the Ph.D. degree in Geography at Cornell University. For other parts see *Scottish Geographical Magazine* and later numbers of the *Bulletin*. Special thanks are given to Professors R. S. Tarr, W. F. Willcox and H. Ries for criticism and suggestion throughout the whole work.

† Read before the Association of American Geographers, Baltimore, 1908.

‡ Whitney. J. D. *Metallic Wealth of the United States*, p. xxi.



treasure was first found, in quantities, in the vaults and temples of the Indian civilizations both in Mexico and in Peru; but it was soon also discovered in the mines from which the natives derived it, and in others new even to them.\*

Balboa, on the Isthmus in search of precious metals in 1513,† found gold in the hands of natives and traded for 500 pounds of it. Cortez on the Gulf Coast of Mexico learned of the wealth of the kingdom of Montezuma, and marched successfully on his capital, destroying the natives in vast numbers in order to effect his purpose and get possession of the treasure. Pizarro is said to have extorted from the Incas \$15,000,000 worth of gold and silver, partly by peaceable means, but with accompanying slaughter and pillage.‡ These discoveries were of prime importance as revealing metals already extracted; and they soon led to the finding of the sources.

The Spaniards wanted gold, silver, or anything which would bring the precious metals easily; and by all methods they acquired about \$250,000 per annum, chiefly gold, during the first thirty years (1492-1521). But during the conquests of Mexico and Peru, and for ten years thereafter, the acquisition of precious metals, now largely silver, rose rapidly to about \$3,000,000 per annum. So far, essentially all the wealth obtained by the Spaniards in America was gotten by conquest, plunder, tribute or barter. Practically no mining had been done prior to 1546, when the fabulously rich silver mines at Potosi in Bolivia were discovered, together with other mines of both silver and gold. And now, by forced native labor, and negro labor, the production of silver took another quick stride and rose to an average of \$10,000,000 per annum until 1600.§

Near the close of the sixteenth century, the Jesuits had spread across Mexico, gotten control of Lower California and discovered the pearl fisheries of the warm adjacent seas. Spanish settlers followed, and these discovered auriferous gravels, the southern end of that long line of gravel deposits extending north and south across the United States and Canada. Settlements grew, and agriculture began. The Indians harassed the settlers until their complaints brought a small army from headquarters, who pursued the Indians into the mountains and in 1771 discovered very rich placers.|| Some 2,000

\* Patterson, R. H., *The New Golden Age*, Vol. 1., pp. 422-424.

† *Ibid.*, pp. 339-340.

‡ *Ibid.*, p. 340; also Bancroft, H. H., *Mexico*, Vol. 3, pp. 571-2; Prescott, W. H., *The Conquest of Peru*, Vol 1, pp. 433, 467.

§ Patterson, R. H., *The New Golden Age*, Vol. 1, pp. 422-424.

|| *Ibid.*, Vol. 1, pp. 347-350.

persons rushed in, within a few months, and the deposits were extensively developed. As in the case of California later, lack of provisions hindered development. It is interesting to note how near these developments led them to California, and how close they came to making discoveries that would have profoundly modified the course of history in the United States in 1846-48, and subsequently.

TWO MOTIVES IMPELLED THE SPANISH. In the course of events connected with the Spanish occupation of America two motives prompted action, motives often operating in the same mind. One was the avowed purpose of the religious orders to promulgate their religion among the natives; the other, the ceaseless attraction exerted by treasure upon the military.\* But, unfortunately, the Jesuits were sometimes influenced by the knowledge of the occurrence of silver and gold. While the chief missionary of a party may have had pure motives, his helpers often completely forgot their specific work and went where treasure bade them go. With this double motive, exploration and conquest rapidly disclosed the New World to the Old. It is not our purpose to trace the influence of the missionary spirit in America. As for the other influence, so far as it operated through the Spanish, and aside from the above mentioned results, its sole effects in America were the enriching of a comparatively small number of Spanish adventurers and the gorgeous maintenance of both Church and State. The commonalty suffered from two conditions, both born in part of greed for gold and silver,—a cramped and restricted trade, and the tyranny, despotism and avarice of officials.

EFFECTS OF GREED FOR GOLD AND SILVER. This very greed for the gold was one of the causes that operated to scatter the energy of the Spanish over Southern North America and all South America, and to prevent their developing cities or fixed industries. They conquered, primarily for its treasure, a territory larger than they could master and administer; and as a result, their occupancy was irregular and short lived over a considerable portion of their possessions.† The thirst for gold made the adventurers wild and led them a romantic career in the New World. They disdained agriculture, neglected singularly fertile plains, and thwarted legitimate commerce. They directed their steps wherever they heard tales of abundant treasure. And it was in these pursuits, so eagerly and mercilessly carried on, that they destroyed the native population and thus greatly lessened the value of their possessions by denuding the

\* Bourne, E. G., *Spain in America*, pp. 170-175; Keller, *Colonization*, pp. 176-8, 203.

† *Ibid.*, p. 201.

land of its native races.\* Had this industrious and rudely cultured race of Indians been conserved and properly dealt with, the Spaniards might have had a loyal colony instead of a rebellious vassalage. And, further, the Indians might have lasted some time as tillers of the soil, if given careful and wise supervision, and thus have produced abundant harvests of products desired in Europe, thereby adding extensive and lucrative commerce to Spain's advantage. And what would have been Spain's gain, would also have been England's and America's.

HYPOTHETICAL CASES. Whether the absence of the treasure would have made the Spanish even endurable masters or not, is a question; but it is certain that, having once scented it, their avarice knew no bounds, and destruction and bloodshed followed in their wake. Had their course been so different as to have perpetuated their occupation of Mexico as long as they held Cuba, American history would have been quite another story. And with a loyal Spanish colony south of us as successful as the British Colony north of us, our history and development might have been considerably different. What has been said of the Spanish in Mexico applies in principle to the Spanish in Peru and Bolivia. We might have had more valuable neighbors in these countries. What might have been is hard to tell, but it is safe to assert that the conditions assumed above would have yielded results very different from those which have passed into history. Spanish power in America was intimately connected with the output of the precious metals. When the treasure flowed freely, Spain flourished both at home and abroad; and when it slackened, her power withered. Probably without the precious metals, her course would have been less offensive, and her influence less pernicious.

ENGLISH AND SPANISH COMPARED. South American mines were worked three-quarters of a century before there was an English settlement on the American continent. A century of Spanish exploration, gold hunting, christianizing and a kind of colonizing, in the South had been completed before the occupation of the northeastern seaboard began; then followed a century of settlement and exploration along the North Atlantic. While, in individual cases, some exploration and exploitation was done by the English immigrants in the vain hope of finding wealth in gold or silver, as colonists they were actuated by other motives. Not finding gold, they were not scattered through the mountains, but became much more of a solid

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\* *Ibid.*, p. 271; Patterson, R. H., *The New Golden Age*, Vol. 1, pp. 337-8.

unit than did the Spanish. Other factors, however, than the absence of gold operated against their becoming scattered. Since Spain had laid claim to so much of the South, the English, when ready to explore and settle, were restricted to the so-called less desirable parts.\* Had there been easily gotten mineral wealth discovered in the Appalachian hills and valleys in the early days, there would have been a rush of adventurers at first, with fewer fixed and staid settlements. Perhaps it would have been roving Spanish, and not English, along the Atlantic coast. Hardships under the less settled conditions would greatly have surpassed those of the early colonists as it was, or even those of California in 1849 and 1850. One might well ask, what would our history have been had there been abundance of precious metals in New England and the Old Appalachians. Of course, ultimately the result would have been the development of the country; but its possession undoubtedly would have been different. Again, suppose the Spanish had not found treasure in the South. Well does Whitney† suggest, "How different might have been American history had there been settlements in the Mexican and South American States instead of silver." No doubt the distribution of gold and silver found response in the distribution of the nations in America in the early days. This is never more clearly seen than when the profoundly different distribution is imagined.

THE FRENCH. The French in America are usually thought of as a people with very slight predilections for the precious metals. They were led by other motives. But we are told that they explored extensively for gold and silver in 1719-20, about the junction of the Missouri and the Mississippi rivers, but, of course, with no positive results. Had they found the object of their quest in the region, the story of French exploration, occupation and possession would have needed another chapter.

SUMMARY TO 1848. Thus it becomes apparent that the desire for the precious metals was an active agent in the explorations carried on by the early voyagers; that the distribution of gold and silver led the searchers into nearly all parts of America south of the thirtieth parallel of north latitude, and aided in scattering the energy of the Spanish over too large a territory; that greed and avarice, finding a fertile soil in the acquisition of American precious metals, caused the Spanish to adopt and maintain a policy toward the natives and toward her colonists both cruel and pernicious; a policy, detri-

\* Keller, *Colonization*, pp. 178-80.

† Whitney, J. D., *Metallic Wealth in the United States*, p. xxi.

mental to the United States through our relations with Mexico; that the lack of gold and silver in the Appalachians has had an influence for good, especially on the English colonists, and through them on the conquest and possession of the northeastern United States; and that the finding of treasure and the increasing production of gold and silver have stimulated geographic exploration and discovery.

The amount of production of gold and silver continued to rise, and the cost to decline from time to time by the introduction of improved processes. It is stated that the production of gold and silver in the New World in 1800 had risen to about \$50,000,000 per annum. It is also known that the production of the United States at that time was scarcely one-third of a million, and mostly gold, per annum; yet, indirectly, the production in other American States has aided the United States and has modified early American history perceptibly.

**THE CALIFORNIA GOLD.** Up to the discovery of gold in California the Pacific side of the continent had remained almost an uninhabited region save for the scattered Franciscan missionary posts; and unvisited except by a few scientific expeditions that crossed the desert and mountain wastes, by whalers who occasionally touched the coast, and by trappers and fur traders who moved up and down the streams and along the coast. The interior was visited even less. Knowledge concerning the whole region was very meager. The few expeditions brought back a little information concerning strips of country actually crossed, and the trappers and fur traders knew the courses of the streams, but the real opening up of the country and the discovery of its resources, agricultural as well as mineral, had scarcely begun in 1848. Transportation was very difficult, food all but wanting, water restricted to widely scattered points, and Indians were hostile. No advantages to be gained by crossing were known. The greatness of the uninhabited region required almost prohibitive provisioning of expeditions purposing to cross; and the pressure of population from the east had not yet reached a sufficient degree to push the frontier into the deserts and mountains.

But with the discovery of the wealth buried so slightly in the sands of the Sierras, was also found the incentive sufficient to induce men to brave the difficulties presented by a long land journey, or to risk the perilous voyage of six months around Cape Horn to reach the otherwise inaccessible California. Incidental to getting into California, more exploration of the interior was done in one summer than had ever been done before, and more than probably would have

been done in the normal course of events in a score or two of years to come.

The fur traders had worked out many routes, but rarely did they point the way entirely across from the Mississippi to the Pacific. Fremont's report in 1845, embodying careful topographic and descriptive work, was a further contribution to the scanty fund of information concerning routes westward. The Oregon trail\* was worked out, and used prior to the gold discoveries by several bands who later, in part, at least, figured in California. Perhaps the Sante Fé trail† from St. Louis to Sante Fé, and the Gila and Spanish trails from there to southern California were as important as any of the older trails. These routes were almost entirely established prior to 1848, hence, their discovery can by no means be ascribed to the influence of this metal; but they were little known and little used save by the fur traders until 1849. During that summer trails became roads, and bridle paths highways, cut-offs were found, new watering-places discovered and in many ways the courses improved. The trail to Salt Lake City through South Pass was used; but, instead of going on northwestward to the Columbia and Oregon, a new trail was worked out down the Humboldt River to Humboldt Sink, then up the back of the Sierras, and down the many ravines on the western face. The route, a well-woven cord nearly to the eastern slope of these mountains, seemed to fray out into many strands leading down the gulches on the western side. The American River, down which Fremont traveled,‡ is fairly typical in the hardships presented. It is astonishing what difficulties men and even women and children will surmount when under the influence of the gold fever.

Mention must also be made of the exploration of routes, mainly by water, which came into use on the advent of California gold, and led from the Atlantic ports to Mexico and Central America and then by stream or on the land across to the Pacific, and thence to California. The route with the shortest land section crossed the Isthmus of Panama, and was found very early both by passengers and freight. Other routes crossed at Tehuantepec, Nicaragua and from Tampico across northern Mexico to Mazatlan and other Pacific ports, all resulting in the exploration of sections of the country, but, neither in occupation nor in possession, any more than the crossing of the

\* Parkman, Francis. *The Oregon Trail*.

† Semple, E. C. *American History and Its Geographical Conditions*, Ch. X and XI.

‡ Fremont, J. C., *Report of the Exploring Expedition to the Rocky Mountains*, pp. 230 f.



arid plains and the mountains, resulted at first in their occupation. Routes discovered and developed by emigrants in search of gold at the end of their journey, differ in this respect from those worked out by the ordinary overland emigrant. Only the discouraged or exhausted halt on the former, while the latter soon become enlivened by settlements of those who find places "good enough for them" and turn aside to occupy.

**EXPLORATION BY PROSPECTORS.** This pioneer exploration, discussed above, took place during the early days of the gold excitement in California; but as the richer deposits became exhausted, the prospector set out, impelled by a continuous vision of "nuggets." He pushed back into the interior wilderness, across deserts, over ridges, into glens, gulches, parks, and long stately valleys; he climbed mountains, crossed divides and traced streams from end to end. While his explorations were not scientific, and his results were not recorded, his discoveries were valuable even aside from the treasure they revealed, because definite reports of his discoveries often got into possession of others; and the latter followed him out to make new settlements or to occupy fields which he had only viewed. And even in the absence of positive statement of valuable finds of minerals, lands, forest, or game, the report that so-and-so had been through certain valleys or over certain mountains or had been exploring in a named locality or direction, served to turn the attention thitherward, and make one feel somewhat acquainted with the places beyond his more complete knowledge. It all aided in the conquest of valley and hillside, spring and water course, to other purposes than the maintenance of wild animals and savages. Desire to find gold, and the reports of gold and silver found all over the West, prompted further exploration, and led to discoveries, not only of precious metals, but of many geographic features, streams, mountains, valleys, and plains, and of many other less attractive but more remunerative resources of the region. Under the powerful stimulus, exploration was very active, and the knowledge of the West extended phenomenally.

**SCIENTIFIC EXPLORATION OF ALASKA.** Nor should this section be concluded without reference to the influence Alaskan gold has had upon exploration. It played no part in the discovery, nor in our gaining possession of the peninsula, but since the announcement of its presence the exploration of the country by prospectors and miners, and by those who would enter the carrying trade to assist the miners, has been very vigorously pushed. In a much closer way careful

surveying and mapping have gone on rapidly under the supervision of the United States Geological Survey, and at the expense of the Federal Government. Of course, this work is not done alone in response to the influence of gold and silver; but the distribution of the work both in Alaska and in the States shows how influential have been the mineral deposits in determining the areas to be surveyed first. Gold and silver have played an important part, as have other minerals.

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## TURNING KERGUELEN ISLAND TO ACCOUNT

The perseverance and energy of two brothers, René E. and Henri Bossière,\* are at last calling attention to Kerguelen Island as a land that may possibly be developed and settled. This island, in the southern part of the Indian Ocean (49° S.; 70° E.), about midway between Australia and Africa, has not been regarded as offering inducements to enterprise. About 300 islands form the group, most of them very small, or mere rocks, but Kerguelen is said to have an area of over 1,200,000 acres, much of it covered with mountains, but with numerous valleys, abundantly watered and covered with grasses in summer.

This view of the island is quite recent. In fact one of the latest gazetteers speaks of Kerguelen as "sterile or covered with moss." In 1890, the under-Secretary of State for the French Colonies published a work entitled "*Les Colonies Françaises*," in which it was said that it was not absolutely impossible to settle in Kerguelen, but the island was so far from all maritime routes that it had no interest for colonists. It was discovered in 1772 by the French mariner Kerguelen, who did not land, but hurried back to France to report that he had seen the great southern continent. When France found, two years later, that the continent was merely a small archipelago, without a tree, Kerguelen was thrown into prison, where he spent four

\* The enterprise of the Bossière brothers is described in *La Géographie* (July, 1900), *Bull. Soc. de Géog. Comm. de Paris* (January, 1910), *Bull. de la Soc. de Géog. de Lille* (March, 1910), and *Bull. de la Soc. de Géog. Comm. de Bordeaux* (June, 1910).

years. Captain Cook visited Kerguelen, a few years later, and the name he gave to the island, the Land of Desolation, has often been applied to it to this day. The island was also visited by the British explorer Ross, and various scientific expeditions, including the Gauss Antarctic party. Kerguelen, deeply cut by many inlets, is now very well mapped.

The French Government paid no attention to its remote possession; and even French maps printed British names of bays and capes, though French nomenclature has been applied to these features by the earlier explorers. The name of Kerguelen was unknown to most persons when René Bossière made the island the subject of his first pamphlet. His brother and he had never visited Kerguelen, but they had spent the years of 1881 and 1883 in southern Patagonia and were surprised to find the conditions there so favorable for the development of sheep raising. Several millions of sheep are now grazing on the pasturage of that south land and the neighboring plains of northern Tierra del Fuego, which, a generation ago, it was thought could never be turned to good account.

One day the brothers read a geographical account of Kerguelen and were impressed with the reported similarity between the climatic conditions of that island and southern Patagonia. They then made a study of the scanty literature on Kerguelen and it seemed to them that here was a French possession which might be turned to some usefulness. The more they thought of it, the more the idea absorbed them. The French newspapers gave space to their communications, their pamphlets were widely distributed and France began to hear the name of Kerguelen. The brothers at last asked the French Government what financial aid it would accord them if they should occupy the island in its name. The reply was that the Government could give no financial aid, but the enterprise would have its recognition and moral support. They would have to carry on the work at their own risk and cost. On these conditions, a decree was issued in 1893, conceding to the Bossière brothers the exploitation of Kerguelen Island and all the accruing profit for a term of fifty years.

The elder brother is a ship-owner, and his father was the last Frenchman engaged in the whaling industry, which has not attracted any French capital since 1863. The brothers believed, from all they heard, not only that sheep-growing might be made profitable in Kerguelen, but also that whaling and sealing in the neighboring waters would add greatly to the prospects of their enterprise.

Having obtained their concession, Mr. René Bossière went to

Patagonia to make a thorough study of the methods of sheep-farming there, while his brother finally enlisted the interest of a number of French capitalists who, in 1900, agreed to give the enterprise financial support to the amount of \$150,000. The services of Captain de Gerlache, the well-known Belgian Antarctic explorer, were secured to lead the first expedition to Kerguelen, and he set out with two small vessels expecting to pick up René Bossière at Magellan Strait. That gentleman waited at the Strait for three months, only to learn, at last, that de Gerlache had put back to France, having decided that he had started too late in the season and, further, that his coal supply was too small for the voyage to the island. The French backers of the enterprise were so discouraged by this outcome of their efforts that they withdrew their support.

The up-hill work that followed need not be detailed here. Nothing but the enthusiasm and indomitable persistence of the two brothers won the day at last. More pamphlets were issued. Special emphasis was placed upon the strong probability that good whaling grounds would be found in the waters around Kerguelen. The Norwegians finally became interested. Money was at last secured to fit out two small French whalers and the Norwegians sent the steamer *Jeanne d'Arc*, of 2,000 tons.

Thus far, the island has been reached twice by the Bossière vessels—in the southern summers of 1908 and 1909. They report Kerguelen, at that season, as glorious to look upon with its snow-crowned mountains towering above valleys deeply carpeted with nutritious grasses supplying the finest of grazing for the livestock that was landed.

Both these expeditions have been in charge of Henri Bossière. His brother, who has been foremost in all the work, has not yet seen the island in which, for 17 years, he has been striving to awaken an interest. In all respects, the two visits to the island have been very encouraging. In 1908, 20 ewes, 2 rams, 3 horses and some hogs were landed on the island. The chief fodder plant, the *Acaëna*, was found in great abundance and was greedily eaten by the horses, sheep and hogs. The plant was wide spread, more than knee high, and would give sustenance to many thousands of sheep. When the expedition departed, the 22 sheep and the hogs were left on the island. In the following year, 1909, the sheep were found to have more than doubled. The lambs were strong and as frisky as kids. Most of them were born on the threshold of winter, but they had suffered no ill results from the inclemency of the bad season. Left

on the island without shelter or any provision for their maintenance, the sheep appear to have lived well by browsing on the roots and shrubs which are in great abundance.

Grain pastes had been provided as food for the hogs, but, to a great extent, they neglected this provision to feed on the same nourishing roots. The brothers have faith in this experiment as affording positive proof that stock-raising on the island may be carried on with great success. Why, they ask, should not hundreds of thousands of sheep be raised on Kerguelen with good care when a few of these animals have actually thrived there, through the winter, without care.

The summer conditions, they say, are all right, and the winters are by no means severe. The mean summer temperature is about 45° F., and the mean winter temperature is about 29° F. Mr. René Bossière writes that if the climate of the island is far from being perpetual spring, it may be said somewhat to resemble continuous autumn. The maximum temperature observed by Henri Bossière in the summer of 1908 was 68° F. Two men of the party remained on the island during the winter intervening between the two expeditions. They kept regular temperature records and the lowest temperature observed in the winter months was -17.6° F.

The fishing experiment was a great success. In the first season, 232 whales were captured, all valuable in commerce, and one of them is among the prominent whalebone whales, which were supposed to be extinct in far southern waters. Curiously enough, René Bossière had enlarged in his pamphlets on his theory that the evidence of the extinction of the southern whalebone animals was inconclusive, and he argued that, very likely, they would be rediscovered in the wholly unfished waters around Kerguelen.

A little settlement was made in Royal Bay, on the south side of the island, and here the blubber was conveyed for trying out the oil. This is the first established center of human population on Kerguelen, and it appears on the new maps as Port Jeanne d'Arc. The whaling industry has opened auspiciously and the brothers say that much better will be done in future. They recall that when Captain Larsen reopened the southern whaling industry at South Georgia, a few years ago, he captured only 200 animals in the first season; but the business has now grown to about 1,000 whales a year. Sea elephants and other marine game are also included in the programme of the future industries in Kerguelen waters. It is expected to make Port Jeanne d'Arc the maritime center of the island

and to establish communications with South Africa, which will be the base of supplies.

It has long been known that there is coal in Kerguelen and the brothers published two analyses of this mineral as they have found it in different parts of the island. They say that it burns well in stoves and in the furnaces of their steamers, but its value in the development of the island cannot be estimated until the extent of the coal measures has been ascertained.

Another steamer, the *Espoir*, of 500 tons, left France for the Island in October last. It is proposed to give large attention to the development of animal-growing and, hereafter, to give shelter to the young lambs, if it is found that they would thrive better with such care. The whaling industry promises to be very profitable, and though the Norwegians have been admitted as co-workers, the Bossière brothers have relinquished none of their concessionary rights. The sea elephant was hunted, early in the last century, by hundreds of ships, and, according to the *Challenger Reports*, the animal had almost completely disappeared by 1840. But they are found to-day, in vast numbers, in the waters around Kerguelen and have established their breeding places (they belong to the seal family) on the island. Their skin and blubber are highly valued and the industry is likely to approach that of whale fishing in value. The brothers are sanguine that the raising of sheep, cattle and hogs will be very profitable, express the conviction that Kerguelen will become a prosperous colony and add:

"We may be permitted to hope that, while we are working for ourselves, we may deserve the favorable opinion of our country."

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## GEOGRAPHICAL RECORD

### NORTH AMERICA

**STUDY OF AMERICAN DESERT AREAS.** The Desert Botanical Laboratory of the Carnegie Institution of Washington is engaged in much work which is of interest to geographers. Under the direction of Dr. D. T. MacDougal it is not only carrying on most important investigations upon the relation of plants to the environment of deserts, but is doing actual exploration and other distinctly geographic work. Some of this work has already been described in articles by Dr. MacDougal upon the Salton Sea, the Desert of Papagueria (*Bull.* Vol. 40, 1908, pp. 705-725), and the Delta of the Colorado (*Bull.* Vol. 39, 1907, pp. 705-729).



During the past spring Prof. Ellsworth Huntington, of Yale University, has been cooperating with the Laboratory in a study of American deserts as compared with those of Asia. The work of the present season was confined chiefly to southern Arizona in the vicinity of Tucson, the site of the Desert Laboratory, and to the adjacent parts of the Mexican state of Sonora. From Tucson, trips were made in various directions to a maximum distance of 200 miles. An automobile was used most of the time. It proved to be admirably adapted to this kind of work where it is often necessary not only to travel great distances over the vast slopes of piedmont gravel which Tollman has called "bahadas," but also to carry water for several days.

The work thus far has been of a preliminary nature. In order to give it a certain completeness, however, two basins were chosen for special study. One was that of the Santa Cruz river, which rises on the Mexican border and flows north through Arizona, past Tucson, to the Gila river. The other was the Asuncion, formed by the junction of the Altar and Magdalena, which rise not far from the Santa Cruz, and flow southwestward through Mexico to the Gulf of California.

The first feature which strikes the student of deserts in southern Arizona and Sonora is the great amount of arboreal vegetation in proportion to the rainfall. This phenomenon leads naturally to a study of the relation of the climate of the country, with its summer and winter seasons of rainfall, to the climatic belts of the earth as a whole, and to certain regions of monsoon deserts in northwestern India in particular.

Another interesting subject of study is the topographic forms due to prolonged aridity, a subject which has been more or less frequently discussed since Blanford wrote his famous paper on Persia over thirty years ago. The allied question of the effect of changing climatic conditions upon topography has been almost entirely neglected, in spite of the fact that all geologists admit that the climatic conditions of the glacial period must have been subject to quite as much change in deserts as in glaciated regions. A good deal of time was therefore devoted to a study of the terraces of gravel which are found along almost every river in the arid parts of North America, and which may be of climatic origin. As an aid in their investigation it was found desirable to obtain as full data as possible on the present action of streams during floods and dry seasons, and particularly on the river channels which, in scores of places, have been cut to a depth of from ten to fifty feet during the last thirty years.

A study of terraces leads almost inevitably to attempts to date them, and this opens the question of the occurrence of changes of climate during historic times. Somewhat to Prof. Huntington's surprise, he found that southern Arizona is full not only of the well-known ruins which have been so much discussed, but of others which have never been described, or, for the most part, even noticed by scientists. They are insignificant in appearance, being merely rows of stones, low mounds, and patches of pottery. They are of great age, certainly 1,000 years old in many cases, and in some cases probably 2,000.

As they occur not only in the regions where agriculture is now carried on, but in many places which are now uninhabitable, it appears probable that the population was one far denser than now. The peculiar character of these relics of ancient civilization, and especially the location of certain old fields seems inexplicable unless climatic changes have occurred. In order to test this conclusion

the investigator attempted to reconstruct the economic conditions of the primitive people who inhabited the ruins, and of the Indians who drove them out, or at least succeeded them. The most significant feature of the evidences as to the climate of the past 2,000 years is the remarkable agreement between America and Asia.

The spring of 1910 was an extremely bad one for the farmers and cattle men of Arizona by reason of drought. For the same reason it was of unusual interest to students of climate. Dying cattle, barren fields, dry springs, and discouraged settlers presented a forcible illustration of the manner in which the density of population is strictly limited by climatic factors wherever the inhabitants depend upon the soil without extensive means of transportation.

A preliminary report of Prof. Huntington's conclusions will be published shortly by the Carnegie Institution.

**MOVEMENT OF LAKE SUPERIOR IRON ORES.** The U. S. Geological Survey has issued a short report by John Birkinbine, statistician of iron production, on the movement of Lake Superior iron ores in 1909. The total shipment amounted to 42,504,110 long tons, a quantity greater than that shipped in any preceding year. Most of this ore was shipped by water. The principal shipping docks are at Two Harbors and Duluth, Minn., Superior and Ashland, Wis., and Marquette, Mich. Nearly 36,000,000 tons shipped from the docks passed through the Sault Ste. Marie canals and through Lakes Michigan and Huron to their places of destination, the greater part of the ore being delivered at Toledo, Sandusky, Huron, Lorain, Cleveland, Fairport, Ashtabula, and Conneaut, Ohio; Erie, Pa.; and Buffalo and Tonawanda, N. Y. Most of the ore received at these ports is consumed in eastern Ohio and western Pennsylvania. In 1909 about 23,000,000 tons were sent to the Cleveland and Pittsburg region. The Lake Superior ores represent about 80 per cent. of the total iron-ore production of the United States.

**GEOLOGICAL SURVEY OF CANADA.** Mr. R. W. Brock, Director of the Geological Survey, in his *Summary Report* for 1909 (307 pp., Ottawa, 1910) says that his staff is too weak, numerically, to accomplish even the most pressing work in a country so large as Canada, and, to some extent, outside assistance was engaged for geological, topographical and ethnological field work. Almost all of the work was along strictly economic lines. It included mapping, working out geological structures, investigating economic possibilities and in other ways securing and making known the geological information required by the prospector and minor to promote the locating and opening of deposits of economic minerals. While the geologists of the survey are not engaged in prospecting, they sometimes make important discoveries. During the year, Mr. Cairnes discovered a new occurrence of coal in the White Horse district and Mr. Dowling found a new and apparently important coal basin in Alberta. Mr. LeRoy's work in the Slovan will stimulate mining there and assist in the discovery of new ore bodies. The facts learned by Mr. Dresser, as to the occurrence of asbestos, afford a valuable clue in prospecting for this important mineral. The scientific investigation of the clays of the Maritime provinces by Dr. H. Ries of Cornell University and Mr. J. Keele opens an important series of studies, which, it is hoped, may be extended to cover the settled portions of the whole Dominion. It has become important to correlate and compile the information on a particular subject into one handy volume for reference. A beginning has been made in this direc-

tion, an official has been appointed to give his whole time to the work and several volumes have already appeared or will soon be published. Most of the volume is given to reports on the work done during the year.

#### SOUTH AMERICA

EXPLORATORY WORK IN BOLIVIA. The *Bulletin* for April, 1909, vol. 41, contained a note on the work of Major P. H. Fawcett in surveying the boundary between Bolivia and Brazil. Since that time two articles have appeared by Major Fawcett: "Survey Work on the Bolivia-Brazil Boundary," *Geog. Journ.*, vol. 35, 1910, pp. 163-166, and "Explorations in Bolivia," *Geog. Journ.*, vol. 35, 1910, pp. 513-532. The former is a report of progress of the Bolivia-Brazil Boundary Commission for 1909; the latter is a complete account of the South American explorations of Major Fawcett up to this time.

The "Explorations in Bolivia" discusses three points: Some general features of Bolivia apart from political and commercial conditions, the nature of exploration in the uncivilized parts of South America, and such personal observations as the author was able to make during the boundary explorations that have been carried on during the past few years. The article brings again to our attention with great emphasis the danger to human life in conducting exploratory and developmental enterprises on the tropical plains. On the lower Beni 25% of the crews of the river boats perish annually of accidents and fever. Of a party of 23 men sent into the upper Madre de Dios 6 years ago to look for rubber only 3 returned, the others died of starvation and its effects. All but 7 of an expedition of 300 peons died while exploring the Rio Blanco, a tributary of the Abuna, a few years ago. Five of the 6 peons on Fawcett's boundary expedition north of Matto Grosso died after their return through fever and the after-effects of starvation. Scores of expeditions have in the past been lost, decimated, or rendered useless through lack of strong constitutions, or through want of determination or experience. Although he has unlimited resources at his disposal, Major Rondon, who is constructing a telegraph line from Cuyaba to the falls of the Madeira, suffers tremendous losses in officers and men in his little army of 500. The pest of insects can not be adequately described. They so reduce and annoy the traveler and resident that fever finds the body an easy prey.

Two other difficulties, the sudden and extreme changes of temperature and the lack of laborers and trails for transportation, are discussed. At Riberalta, 11° S., a change from 104° to 44° has been recorded in two hours; and in August, 1908, a drop from 78° to 41° was observed. These sudden changes are common from May to October and are the usual accompaniments of south winds that last from two to four days with rain.

The difficulties of securing adequate labor supply is everywhere the dominant one and even transcends the diseases, the heat, and the insects, in the problem of developing resources. Peons are usually unobtainable at any price. Both the Indian and the half-breed are unreliable, difficult to please, lazy, and desert without notice. East of the Bolivian Cordillera, riches are measured by the number of men at the command of an individual. A man with 50 peons is said to be a capitalist. Forced labor is the result, and in its train have come all the evils of race hatred and warfare. A perpetual war of reprisals is waged between civilized and savage men. That slavery actually exists in the Amazon

basin is a fact that is hidden partly by the word "peonage" and partly by the stout denials of the rubber men, whose business rests directly upon the evil system.

Without at all criticizing this valuable paper in regard to details of observations made by the author, we may yet say that some of the general statements need modification. The broad statement that there is coal on the high plateau of Bolivia and coal in quantities east of the mountain belt might be thought to mean a great deal; as a matter of fact, the extent of the coal resources is undetermined, but it is reasonably clear that there is very little indeed on the plateau. Nor can irrigation alone solve the problems of the high plateau. The climate is irremediable, much of highland Bolivia is barren salar and steep mountain slope, and the available water, even if skillfully employed, would not irrigate all of the land.

I. B.

#### AFRICA

BELGIAN EMIGRATION INTO THE CONGO. In order to promote colonization in the Katanga District of the Belgian Congo, from the mother country, the Government has decided to give to approved colonists and their families free transportation (third class) from Belgian to Katanga and free freightage for their household effects and implements of labor. This aid will be extended only to those who are 21 years old or over, healthy and with sufficient means to establish themselves in the new country or who have a contract assuring them of employment in Katanga. This district is the center of the chief mining interests of the Belgian Congo and is one of the most elevated and least unhealthful parts of the Colony (*Kol. Zeitsch.*, No. 17, 1910).

LAKE CHAD AND CLIMATIC CHANGES. Contradictory reports continue to come regarding the evidence of changes of climate to be found in the Lake Chad region. The general view is, probably, that the lake is diminishing in size as a result of a change (or oscillation) of climate to a drier period. In *Petermann's Mitteilungen* for January, 1910, Dr. Hugo Marquardsen emphatically expresses the opposite view. "Personally," he says, "on the basis of all the results of exploration and of my own observations, I have reached a very different conclusion." At the present time, the writer agrees that there is a marked retreat of the waters of the lake, but this phenomenon cannot be shown to have existed far back. From 1823 to 1902 there was no diminution in the size of the lake. The present loss of water began suddenly after 1902, and is therefore not to be attributed to any permanent climatic control.

R. DEC. W.

#### ASIA

DR. SVEN HEDIN'S METEOROLOGICAL OBSERVATIONS IN TIBET. In the June number of *Petermann's Mitteilungen* there is published an account of Dr. Sven Hedin's travels in Tibet in 1906-08, in which the meteorological results are briefly reviewed. A full study of the data has not yet been made. The region is one concerning whose meteorology practically nothing has thus far been known. Dr. Hedin took observations thrice daily during the whole period of his journey, including pressure, temperature, humidity, direction and force of the wind, cloudiness and rainfall, together with notes on other phenomena such as insolation, temperature of lakes and springs, etc. Nearly twenty months were spent, with the char-

van, under a pressure of about 15.75 inches, at three miles above sea level. Greater altitudes were reached, as *e. g.*, the Dingla Pass, July 8, 1908, where the altitude was about 19,300 feet and the pressure below 15 inches. The strong constitutions of the men and animals living at these great altitudes is noteworthy; yaks, antelopes, donkeys, cattle, sheep and dogs are all unusually strong and active. Dr. Hedin's observations showed temperature ranges between 68° and -40°. Even in the most severe winter storms the temperature was observed to be between -5° and -20°. Precipitation comes in all seasons, the winter snowstorms being especially severe. The intensity of insolation is naturally very great. Dr. Hedin points out that the summer is much rainier than the winter. In winter, more snow falls in western Tibet than in eastern, while in summer it rains more in eastern Tibet. There is more snowfall on the highest elevations of the Trans-Himalaya in summer than in winter, a fact which is explained by the moisture brought by the southwest monsoon.

R. DEC. W.

#### POLAR

PLANS OF THE BRITISH ANTARCTIC EXPEDITION OF 1910. Captain R. F. Scott's large steam vessel, *Terra Nova*, left Cardiff for the south on June 15. Capt. Scott has outlined the plans of his expedition (*Geog. Journ.*, Vol. xxxvi, No. 1, pp. 11-20), and the following facts are taken from this publication:

The *Terra Nova* is expected to reach Melbourne, *via* Cape Town, about Sept. 13. After a week at Melbourne, the vessel will go to Sydney and thence to Lyttelton, New Zealand, which she will reach about Oct. 13. Here she will take on petrol for the motor sledges, forage for the ponies, frozen mutton, the motor sledges and twenty ponies and thirty dogs which Mr. Meares has been collecting in Siberia. The expedition will leave New Zealand towards the end of November and hopes to reach McMurdo Sound, South Victoria Land, about the end of December.

The party numbers fifty men, of whom sixteen constitute the scientific staff. The list of officers, staff and men is appended to Captain Scott's statement.

At McMurdo Sound, the hut, provisions and equipment of the western party will be landed. This party will include twenty-two to twenty-five persons, and, by the third week in January, when sixty to seventy days still remain for traveling, most of them will start south to lay depots. At the same time, the vessel will steam east to land the eastern party on King Edward VII Land. If a suitable spot can be found for wintering, six or seven men will be left here, with full equipment, for the exploration of this unknown land in the following summer.

The ship will then return to McMurdo Sound and then proceed northward, probably about the third week in February. If sufficient coal remains, she will investigate the pack in the region of the Balleny Islands (directly north of South Victoria Land) and pass westward through or to the south of these islands. Captain Scott hopes that thus she may throw some further light upon the coastline between Cape North and Adélie Land (a part of Wilkes Land). This work and biological investigations will occupy the ship during March, after which she will return to New Zealand.

Captain Scott hopes that, by the end of April, the western party will be all safely re-established in the hut with depôts of supplies laid well south on the Great Ice Barrier (extending southward, across Ross Sea, to the continental coast). As the excessive winter cold does not begin to subside till September

and the conditions of travel are severe, even in October, he does not propose to start on the southern journey till October. That month and November will be spent in crossing the ice and ascending the glacier, and he hopes to reach the upper continental plateau early in December. It would be an ideal day to reach the South Pole, if it might be attained on Dec. 22, when the sun achieves its maximum altitude. With his special 4-inch theodolites and the sun at an altitude of  $23^{\circ}$ , the position of the pole could be determined within one mile. But Captain Scott does not lose sight of the fact that the attainment of the pole is by no means a certainty.

Lieut. E. R. G. R. Evans, of the Royal Navy, who has had Antarctic experience, will be second in command and will remain with the western party. Lieut. Victor Campbell, an ex-naval officer, will be in charge of the eastern party. Five members of the staff and seven members of the crew have had previous Antarctic experience. Dr. E. A. Wilson, zoologist and artist, will be chief of the scientific staff. Three geologists, Mr. T. Griffith Taylor, Mr. W. G. Thompson and another to be chosen in Australia will serve, one with the eastern, one with the southern or polar party, and the third will have a roving commission to explore Victoria Land within easy distance from the western station. Messrs. E. W. Nelson and D. G. Lillie, biologists, will have charge of the study of marine fauna. Five hundred fathoms have been fixed as the limit at which dredging operations can be conducted. Meteorology will be in charge of Dr. G. C. Simpson of the Meteorological Department of India. He will have a special hut and space for a very large outfit of scientific instruments. He will also undertake the magnetic and gravity observations on shore, auroral photography and make studies in other branches of physical science. Mr. C. S. Wright will be chemist of the expedition.

On ship board, Lieut. H. H. L. Pennell will have charge of the magnetic and meteorological records, assisted by Lieut. H. R. Bowers, and also of the survey or resurvey of any lands that may be visited by the *Terra Nova*. Surgeons G. M. Levick and E. L. Atkinson will look after the health of the men and also serve in scientific capacities, the former being a zoologist and botanist and the latter a bacteriologist. All members of the expedition have been medically examined and found fit for the work and have shown great enthusiasm for the arduous responsibilities before them.

#### EDUCATIONAL GEOGRAPHY

THE JOURNAL OF GEOGRAPHY. With the number for June, Prof. R. E. Dodge retired from the editorship and management of this educational magazine. He founded the *Journal*, and eight volumes, each containing ten monthly numbers, have been issued by him. The place of publication is now transferred from New York to Madison, Wis., the Department of Geography of the University of Wisconsin having assumed the work of continuing the magazine. Prof. R. H. Whitbeck, of that institution, is the new editor, and the first number under his direction will be issued in September, soon after the re-opening of the schools.

It is gratifying to know that the work inaugurated by Prof. Dodge is to go on. The publication is needed. It has been devoted to the interests of teachers of geography in the elementary, secondary and normal schools. It has had a marked tendency to raise the standards of geographical education, which, not



many years ago, lagged far behind those of nearly all other great nations. The *Journal of Geography* has been conspicuous in the movement to give teachers clearer ideas of the content of geography, to introduce more effective methods of instruction and to place in the hands of boys and girls better textbooks and better maps. It has helped to bring about the marked improvements that have been made. But a great deal remains to be done before school geography at home is placed upon the high plane which it occupies in some of the European countries; and there is good reason to believe that this periodical will continue to exert a helpful influence that could not well be spared.

### PHYSICAL GEOGRAPHY

**CLIMATIC VARIATIONS.** Henryk Arctowski, well known to meteorologists, is at present engaged in a far-reaching investigation of simultaneous climatic variations over the earth's surface. Some of the results already reached are discussed in a recent monograph entitled *L'Enchaînement des Variations Climatiques* (Brussels, Soc. Belge d'Astron., 1909). The author has begun his work with a study of the annual mean temperatures, and in order to secure a comparable series of observations he has thus far limited himself to the ten-year period 1891-1900. For these years he has collected the observations for 804 stations,—an immense labor, which has involved the examination of thousands of publications and the writing of hundreds of letters for information. Of these stations 490 are in Europe, 97 in Asia, 38 in Africa, 134 in the two Americas, and 45 in Australia. The tables contain more than 20,000 figures. For each year, and each station, the departures between the mean annual temperatures and the mean normal temperature are determined. These differences (negative or positive) are placed on maps, and the points representing the same departures are joined by lines. It then appears that the areas where there are excesses or deficiencies of temperature do not fall accidentally here or there, but that they form vast zones. These zones Dr. Arctowski calls *thermopleions* and *antipleions*. More than 150 of these maps are given. It is seen that the temperature of the earth's atmosphere has been higher during the years 1896 to 1900 than between 1891 and 1895, the positive excess for the whole globe being between  $0.4^{\circ}$  and  $0.9^{\circ}$  F. The displacement of the annual pleions and antipleions is apparently very irregular, but there seem to be real centers from which the variations originate. In order to investigate further the mechanism of the formation of pleions, to find the laws which govern their displacement, to learn to predict the regions which will have excess or deficiency of temperature, and where the crops may therefore be inferior or abundant, the author has decided to investigate the monthly means of temperature, as well as pressure. The whole study is a very important one, and further results will be awaited with great interest.

R. DeC. W.

### GENERAL

**THE TENTH INTERNATIONAL GEOGRAPHICAL CONGRESS.** The committee that is making arrangements for the meeting of the Tenth Congress which will be held in Rome next year, has issued its first circular. The time of the meeting will be Oct. 15-22, a week that will also be given in Rome to the commemoration of the proclamation of the Kingdom of Italy. This event, the committee believes, will

add additional interest to a visit to Rome without interfering with the business of the Congress. The President of the Congress and also of the organizing committee is the Marquis Raffaele Cappelli, President of the Italian Geographical Society. The regulations governing the Congress, printed in the circular, follow the same general lines as those adopted for the earlier Congresses. Eight sections, comprising the principal departments of geography, will be constituted and the languages of the Congress will be Italian, English, German, and French. Abstracts of communications which are proposed for presentation should reach the executive committee not later than April 30, 1911; and all reports on matters originating in previous Congresses, or recommended by the executive sub-committee, must be presented in full not later than August 31, 1911. Delegates to the Congress may be appointed by government, governmental departments, institutions and societies whose interests are geographical, and Universities and other higher schools which maintain professorships of Geography. Those who wish to be members are requested to send in their names at an early date, and upon the payment of the subscription (25 lire or \$5) they will receive their ticket of membership and all the information that will be issued from time to time. The treasurer of the Congress is avv. Felice Cordon, La Società Geografica Italiana, Roma, via del Plebiscito, 102. Information with regard to routes and accommodations in Rome may be obtained by addressing the "Ufficio viaggi ed informazioni gratuite," 372-373 Corso Umberto 1, Rome. The programme of excursions will be issued later and the complete programme of the Congress will be sent to all members.

THE OCEANOGRAPHICAL MUSEUM AT MONACO. This museum, which the Prince of Monaco has built, was opened with festivities that extended from March 29 to April 1. It was the occasion of an international gathering of the representatives of scientific societies. The building is a beautiful structure of white limestone, standing on the southern extremity of the peninsula of Monaco. It contains a large collection of apparatus for physical oceanography, collections of marine organisms, labelled in three languages, the nucleus of a fine exhibition of marine industries, and laboratories in which students and investigators of all nations may find the most ample facilities for carrying on their studies relating to the various sciences of the sea. The opening address, delivered by the Prince of Monaco, is printed in full in the *Geographical Journal* (Vol. 35, No. 5, 1910).

The Museum is a part of the Oceanographical Institute which the Prince has established to promote the interests of the science to which he has devoted his life. The first branch of the Institute is the School of Oceanography, which the Prince has founded in the University of Paris and for which buildings are now being erected. Three professors are conducting the work of the school: Dr. A. Berget for Physical Oceanography, Prof. L. Joubin for Biological Oceanography and Dr. Portier for the Physiology of Marine Life. The second branch of the Institute consists of the museum and laboratories at Monaco.

## GEOGRAPHICAL LITERATURE AND MAPS

(INCLUDING ACCESSIONS TO THE LIBRARY)

### BOOK REVIEWS AND NOTICES

**Bygone Days in Chicago.** Recollections of the "Garden City" of the Sixties. By Frederick Francis Cook. xvi and 400 pp., nearly 100 illustrations from rare prints and photographs, and index. A. C. McClurg & Co., Chicago, 1910. \$2.75 net.

Probably no other man is so well qualified as Mr. Cook to write such a book as this about Chicago. The book is not a history, but it supplies abundantly, and in rich and large variety, the materials for history, for it paints the atmosphere and gives insight into the psychology of the young and lusty days of a great city in embryo; and, in an important sense, Mr. Cook was a part of what he saw and heard. He was a keen, alert and trusted newspaper reporter in a day when Chicago was so small that such a chronicler of the times as he, was acquainted with every one of consequence, was the repository of secrets as well as of news and gossip and knew just what was going on in all the strata of Chicago's life and activity. He has given in this book a most graphic picture of Chicago as a strippling, and it is all presented, not in the form of historical narrative but in the way of incident, anecdote and shrewd characterization of men and events. It is one of the most readable books of recent publication; and everything in it seems to have its own value for the light it throws upon those remarkable times and the manner and quality of the men who helped to build the foundations of Chicago.

**Camp and Camino in Lower California.** A Record of the Adventures of the Author while exploring peninsular California, Mexico. By Arthur Walbridge North. With a Foreword by Admiral Robley D. Evans, U. S. N. 346 pp., illustrations, bibliography and index. The Baker & Taylor Company, New York, 1910. \$3.

Mr. North loves the fascination of the wilds. Years ago, he chose as the scene of his adventures the most utterly neglected wild he could find on our continent and that, of course, was the large peninsula of Lower California. He may almost be said to have made that great adjunct of Mexico his own special preserve, for he is the only English-speaking American and, as far as we know, the only man who has ever traversed it from end to end, zigzagging his way over the Sierras and across the desert plains between the Pacific and the Gulf. Mr. North is, to-day, our best authority on the geography of Lower California, and his first book, "The Mother of California," is the repository of a large number of hitherto unknown facts about that unique and untraveled region.

It is gratifying to see that the author has reproduced in the Appendix to the

present volume a succinct account, from his earlier work, of the natural features of Lower California. It is the best, condensed statement of the geography of Lower California that we have; and it is the fitting groundwork for this book-full of his adventures among the wild game of the mountains and the plain, among the Indians, the Mexicans, the Missions and the petroglyphs painted and drawn on the rocks by unknown predecessors of the present population. The volume is not only very entertaining, but has also distinct value for the added light it throws upon existing conditions and many phases of life in the peninsula.

**The Life of George Grenfell.** Congo Missionary and Explorer. By George Hawker. xxvi and 576 pp., 70 illustrations from photographs, 5 maps and index. Fleming H. Revell Company, New York and Chicago, 1909. \$2.

George Grenfell was a great explorer as well as a great missionary. Next to Alexander Delcommune, he revealed to the world more of the Congo basin than any other man. He was the pioneer explorer of several of the large southern tributaries, he discovered the lower part of the Mobangi affluent, the largest Congo tributary, and ascended it for 400 miles; and he made the best survey and map of the Congo between Stanley Pool and Stanley Falls that has been produced. He ranks among the great African explorers, and the Founder's Medal which the Royal Geographical Society bestowed upon him was a just recognition of his merit.

At the same time, he never lost sight, for a moment, of the missionary service to which he had dedicated his life. He not only preached the gospel, but he believed in the industrial education of the natives and was a powerful influence in promoting it. The future prosperity of the Congo will depend, to quote his own words, upon "the gradual development of a more or less educated community, with a personal interest in the exploitation of the resources of their country."

It was agreed that Sir Harry Johnston, in his book on Grenfell, should treat of him as the explorer, while Mr. Hawker, in the present volume, should deal with the missionary side of the man. But Grenfell was a missionary who was always an explorer and an explorer who was always a missionary, and it is very difficult to keep the two phases of his great work apart. We see not a little of the explorer in this book, but, after all, the great, modest missionary dominates. In this volume is finely revealed the man who gave his life to the Congo peoples, his practical common sense, his fullness of resource, his gentleness, the love the people gave him and the good he did.

**Die Vereinigten Staaten von Amerika.** Ihre politische, wirtschaftliche und soziale Entwicklung. Von Dr. Paul Darmstaedter. vi and 242 pp. and index. Quelle & Meyer, Leipzig, 1909. M. 4.

The author is professor of history in Göttingen. The small size of the book imposes great limitations upon the historical treatment of the United States from its colonial days to the present time and the author's attention is necessarily confined to the essence of things. He attempts to give only those factors and results of our political, industrial and social development that count most in a correct appreciation of this country. From our own point of view, it may be said that he has succeeded admirably in this effort. The book has no resemblance to those

"Compendiums" which give only the bones, not the life of history. He touches the larger aspects of our history, and describes and discusses them in a clear and illuminative manner. We may be gratified that this little work will tend to impress its readers with a deep and accurate perception of the genius of this American nation and the circumstances and conditions that have so largely shaped its development. Each of the many sections is introduced by a bibliography. The work is a good example of the results of painstaking and thorough research which so many German scholars exemplify in their writings.

**The Cleavage between Eastern and Western Virginia.** By Prof. C. H. Ambler. *American Historical Review*, July, 1910.

In this paper, Prof. Ambler, of Randolph-Macon College, shows a keen appreciation of the geographic differences between transmontane and cismontane Virginia and the marked economic and political differentiation of these two districts largely as a result of their geographic contrasts. Prof. Ambler takes the Blue Ridge as the boundary between the two sections and describes eastern Virginia as a relatively level region with fertile soil, a deeply indented coast line and temperate climate, while western Virginia is described as having a more broken and mountainous or hilly surface, less fertile soil and a more rigorous climate. In the East was the plantation and its concomitant slave system, producing staple crops which found easy shipment at the deeply drowned river valleys of the tidewater region. As a result of the self-sufficing plantation system and the poor transportation facilities, villages and trade centers were not developed. In the West, the small farm operated by individual owners was the rule. Villages were relatively frequent and were centers of trade and influence.

Politically, the two sections were usually antagonistic. In the movement for independence, the western counties led the more conservative East. On national questions, the Piedmont and tidewater country were inclined to be individualistic. The mountain region, with its early need for protection against savages and its subsequent need for facilities to transport its coal and agricultural products, demanded a strong central government.

The author traces the struggle of the West with the East for political equality in the Assembly, a struggle so bitter that, from 1830 to 1850, there was a strong movement for a new commonwealth west of the Blue Ridge. Not until 1850 did the white population in western Virginia outnumber that in eastern Virginia and secure a fair representation in the Assembly. The slavery controversy appears not to have been strongly geographic. The people of western Virginia were in favor of allowing slavery, although the number of slaves was relatively very few. This section had voted against the resolutions of 1798 and the nullification movement, but the final dismemberment of Virginia was upon the question of secession. The mountainous west remained with the North while the Piedmont and Tide Water joined the South.

A geographer, perhaps, would wish that the geographic factors were more adequately described. A concise description of the rolling Piedmont, the smoothly sloping Coastal Plain with its drowned valleys, the maturely dissected plateau in West Virginia separated from the Blue Ridge by the level floored Great Valley, would give the reader a mental picture of the two contrasted regions. The climate of east and west Virginia is characterized respectively as "even" and

"uneven." This fails to convey the contrast between the milder, shorter winters and the shorter frost season of the East and the larger range of temperature, longer winters and longer frost season of the west. F. V. EMERSON.

**Distant Lands**—An Elementary Study in Geography. By H. J. Mackinder, M.A. xvi and 296 pp., 210 ill. and 12 colored maps. 8vo. George Philip & Son, London, 1910.

Professor Mackinder's *Geographical Studies*, of which this is the third, treat the subject in a progressive manner, so that the pupil comes gradually into a knowledge of the whole world. This volume, like the second, is both historical and geographical. There are good maps, many being orographical; and it may be noted that they are up to date, northeast Greenland, for example, having the latest delineation after the results of the Erichsen expedition. Every young student will find approved geography in these books, and there could be no better preparation for the more advanced study of the subject.

**Tropical Medicine, Hygiene, and Parasitology.** A Handbook for Practitioners and Students. By Gilbert E. Brooke, M. A. Cantab., etc. With numerous illustrations, including 26 plates. Small 8vo and 498 pp. Charles Griffin & Co., London, 1908. 12s., 6d.

An important work for the physician or traveler in tropical countries, written by a man of long and varied experience in these fields. There are descriptions of diseases and their treatment, much practical information as to food, exercise, clothing and general hygiene; and a description of mosquitoes, fleas, ticks, etc.; and classifications of animal and vegetable parasites; also a chapter on disinfection, one on the blood, and advice on microscopy and photography, two most valuable assistants in the field of pathology. The author has been successful in his task, which, he remarks, has been a pleasant one.

**Ober-Ammergau and the Passion Play.** A Practical and Historical Handbook for Visitors, by the Rev. E. Hermitage Day, D.D., F.S.A. 96 pp. and 24 illustrations. Small 8vo. A. R. Mowbray & Co., London (1910). Milwaukee, The Young Churchman Co. 45c., parchment.

This little volume, giving a concise and accurate account of the Passion Play, including a description of the village, is most welcome. There is added a synopsis of the play and other data of value to those who are there or who intend to witness the performance. For others, the book will be of interest in its descriptions and will serve as a reference work on the subject.

**El Inglés para Cada Cual.** Con Pronunciación Fonética. Para aprender el Inglés por sí mismo. Por William Chevob. pp. 128. 8vo. E. Marlborough & Co., London, 1909. 1s.

Handbooks of this practical kind for language study are highly useful and enable many to acquire foreign languages. Marlborough & Co. have published a large number of them, including Arabic, Hindustani, Japanese, Tamil, and even Esperanto. Pronunciations in all cases are quite clearly indicated. Any intelligent person may "pick up" a working knowledge of a language through these books.



**Historical Furniture.** A Description of the "Queen Mary" and "Prince Regent" Suites, presented by Syed Sirdar Ali Khan, eldest son of the late Nawab Sirdir Diler Jung Bahadur, C.I.E. of Hyderabad (Deccan), to the Victoria Memorial Calcutta. 8vo pamphlet, 16 pp. and 7 plates. The Times Press, Bombay, 1908.

From London to Brighton, from Brighton to Hyderabad, from Hyderabad to Bombay is the record of the journey which finally landed these two splendid suites of Jacobean furniture in India and into the possession of Syed Sirdar Ali Khan, who now presents them to the Victoria Memorial at Calcutta. There is much interesting history connected with the pieces. There is a description of some pieces and photographs of several.

**L'Anglais Sans Maitre.** Avec la prononciation de tous les mots. Pour apprendre l'Anglais Soi-même. Quatrième Édition, Revue et Agrandie par M. H. Hébert. pp. 128. 8vo. E. Marlborough & Co., London, 1909. 1s.

**Ireland and Great Britain in Outline.** By J. B. Reynolds, B.A. viii and 184 pp. 8vo. Adam and Charles Black, London. The Macmillan Company, New York, 1910. 50c.

The series of small volumes, of which this is one, on Regional Geography, are admirable for use in the class-room. The method is simple, adequate and comprehensive.

**Unteritalien und Sizilien.** In Neuer Bearbeitung. Fünfte Auflage Mit 21 Karten und 37 Plänen und Grundrissen. Leipzig und Wien, 1909. Small 8vo. xii and 372 pp. (Meyers Reisebücher) Bibliographisches Institut, Leipzig, 1909.

This new edition of the standard "Geell Fels" guidebook to Southern Italy and Sicily has had the advantage of a thorough revision by Dr. Schoener on the ground. There are excellent maps of the south part of Italy with Sicily, and of Sicily on a fairly large scale by itself. The plans of the towns are extremely clear and those of Naples, Palermo and Messina are on a good scale. Pompeii has a careful map and there are some two dozen pages of text devoted to this subject. For any traveler conversant with the German language this book will be found most desirable.

**The Mechanics of the Earth's Atmosphere.** A Collection of Translations. By Cleveland Abbe. Third Collection. Smithsonian Miscellaneous Collections. Vol. 51. No. 4. Pp. 617. Large 8vo. Washington D. C., 1910.

Professor Abbe is in many senses the mainstay of meteorology in the United States. For years he has been doing the most careful and laborious work in order to establish the science of meteorology upon a firmer basis, and to encourage more advanced instruction in the subject. An important part of this work has been the translation of a large number of German, and other foreign memoirs bearing on the mechanics of the atmosphere. Of these collections there have been issued "Short Memoirs on Meteorological Subjects" (Smiths. Rept. for 1877, pp. 376-478), and "The Mechanics of the Earth's Atmosphere" (Smiths. Misc. Coll., 1891). In the present volume Professor Abbe has brought together a

third valuable series of papers, twenty-four in all, including nine important ones by von Bezold. The well-known memoir by Guldberg and Mohn, on the movements of the atmosphere, translated by Waldo and revised by the writers, is also included. This collection, while not of such a character that it will appeal to the ordinary student or teacher of meteorology, includes a large and very valuable series of papers which those who deal with the more involved physical and mathematical aspects of the science will be glad to have in this convenient form, in English. Professor Abbe may be assured of the increasing debt of gratitude which American meteorologists feel toward him.

R. DEC. W.

**Practical Guide to Great Britain and Ireland.** Preparation, Cost, Routes and Sightseeing. By M. D. Frazar. Two volumes. Vol. I, England and Wales, pp. 473. Vol. II, Ireland and Scotland, pp. 338. \$1.50 net per vol. Small, Maynard & Co., Boston, 1909.

**Practical Guide to Latin America.** Including Mexico, Central America, The West Indies and South America. Preparation, Cost, Routes and Sightseeing. By Albert Hale, A.B., M.D. Small, Maynard & Co., Boston, 1909. \$1 net.

These concise little guide-books are, as their titles claim, "practical," and they also offer a large amount of "boiled down" information necessary for the traveler who desires to be comfortable and to use his time effectively. The books, while complete, are not designed entirely to supplant local guide books and Baedeker, but rather to supplement them by covering all points and indicating where other books may be most useful for extended details. Both are written from the American standpoint entirely. The authors are personally familiar with most of the places described, Mr. Hale having also the advantage of official connection with the International Bureau of American Republics.

We have now awakened to the fact that Latin-America is progressing at a more rapid rate than nearly any other part of the world—particularly South America, where magnificent cities like Buenos Aires have over a million of population, with splendid buildings and a life that is quite Parisian. The Transandine Railway is completed through the great tunnel, 10,460 feet long, connecting with Valparaiso, 888 miles away on the Pacific and with the longest piece of straight track ever constructed, running 175 miles without a curve, and with one curve, 206 miles. To him who has seen Old England, the Latin-America guide book will open a new world full of pleasant surprises.

**The Wayfarer in New York.** Introduction by E. S. Martin. 8vo, cloth. pp. xxii and 266. New York, The Macmillan Co., 1909. \$1.25.

This little volume is a medley of selections from various authors who have visited the locality from the day that Hudson sailed up the river, the first quotation being from the journal of the mate "Robert Juet of Limehouse," who afterwards was so treacherous towards his commander. The introduction is written in the clever vein of the author and gives a unique and interesting account of the city as it is now, "not recommended as a birthplace," but excellent for those "who have been born and have more or less grown up somewhere else." "Now it is wonderful rather than charming, a marvelous city that people's eyes pop out over; that changes and develops and shoots up and stretches out so fast

that habitual residents find new marvels for their own eyes every time they show the town to a visitor."

The extracts from authors are well chosen and comprise, Walt Whitman, Peter Kalm, Dickens, Stedman, Bryant, Bunner, O. Henry, John C. Van Dyke, and many others, grouped in ten topographical divisions of the city.

**Rapid Night-Marching Made Easy.** Consisting of Simple Rules for finding the true Bearing by Means of Stars. Suitable for Soldiers, Explorers, and Travellers Generally. With a Description of Reeves' Astronomical Compass and Time Indicator. By Major W. A. Tilney. 15 pp. Edward Stanford, London, 1909. 2s. 6d.

Three methods are given for finding the true bearing of a star, at any hour. The instrument described is a simple appliance for finding the north and south line and the true bearing of any object or direction, as well as the local mean time, by the sun or stars.

**Pioneering.** By Frederic Shelford, B.Sc., etc. A series of Four Articles contributed to "The Engineer." Revised, 8vo, pp. 82. E. & F. N. Spon, London, 1909. \$1.25 net.

Outfitting for expeditions that are to proceed far from the facilities of regulated traffic is a very different matter now from what it was thirty or forty years ago. Besides the assistance of such books as this to-day, one can step into a shop in almost any large city and order then and there almost any thing he requires, tents, boots, guns, special foods, cooking-kit, made expressly for the rough use of camp and pack-train, and at far less cost than formerly.

The difficulty with any book on outfitting is in adapting it to all conditions and countries. An equipment that in Africa would be perfection, in northern Canada or Labrador would be almost useless. There is a difference, too, between pioneering and exploring, and this book is devoted to the former. The explorer would find it necessary to discard many of the articles enumerated here as desirable.

What explorer, for example, would think of carrying with him a folding tripod washstand—not that this article is not most convenient but that it takes up space, adds to the weight, and is about the least necessary article imaginable. The same may be said of a "Uganda" table or an armchair also advocated. The author says "the experienced explorer or traveler will arrange his kit in such manner that there is nothing wanting from a tent to a tin-opener—from a mattress to a match"; but most explorers arrange it so that there shall be nothing unnecessary. Some, therefore, make a hunting-knife take the place of the tin-opener and dispense altogether with the mattress. Naturally, it depends on circumstances, and the region to be visited; what one intends to do; and the financial backing of the enterprise. In Africa where natives are abundant and cheap, and game is likewise, everything may be carried; but in an uninhabited, trackless country where a few underfed pack animals must worry along with all the supplies needed, one quickly learns to leave the "frills" behind. You can even make a good coffee grinder out of an empty tomato-can when necessary—at least it is easy to pulverize coffee in one if you know how.

The tumblers with wicker covers which the author advises seem entirely unnecessary, for the cups carried are good enough.

His list of utensils is made on the basis of two persons, and he makes the mistake made by all outfitters in allowing but two spoons and two forks, etc., to the two persons. If in a well-watered country, this might answer, as one can wash his spoon to change from coffee to soup or to jam, but in the desert it would necessitate a large amount of licking. Besides, there are no serving spoons, forks, etc. It is better to throw away the washstand and add in its place some extra knives, forks, spoons and cups and the dishwashing can then be done after the meal. For two persons at least six teaspoons and as many of a larger size should be provided. The author also enumerates two enamelled egg-cups, which, in an explorer's outfit, seem very odd. Eggs are not easy for an explorer to carry, and they soon arrive, even if not broken, at a state where the less said the better. So why egg-cups? There is no word about the German Erbswurst, one of the very best camp preparations ever concocted, nor are leggings advised. Whiskey, wine and mineral waters are included, but generally these things are of no value whatever. On the whole it is a useful book and any prospective pioneer or explorer will learn something from it.

**The Beginnings of New York.** Old Kingston—The First State Capital.

By Mary Isabella Forsyth. Small 8vo, paper, 69 pp. Richard G. Badger, Boston, 1909.

These are two pleasantly written sketches of New York history, the second being reprinted from the *New England Magazine*. The "Beginnings of New York" goes back, of course, to the entrance of Hudson and the start of the first settlement the year after Hudson's visit, that is in the year 1610, just 300 years ago. Two years later forts were established at Albany and at Kingston Point. Kingston, as is well known, became an important place, and remained so. Houses built in the very early period are still standing there and the city will one day be visited more than now for a view of the relics. One of the old landmarks has been made into a museum and so will be preserved, but there are one or two others whose fate is not so certain. In this country we have not yet reached the stage where historical buildings are thought much of, and little books like this do good missionary work.

**The March of Portolá** and the Discovery of the Bay of San Francisco.

By Zoeth S. Eldredge.—**The Log of the San Carlos** and Original Documents Translated and Annotated by E. J. Molera. Illustrations by Walter Francis. 8vo. 71 pp. DeWitt & Snelling, Oakland, Cal. 50 cents.

Probably very few persons East or West knew who Portolá (or Portolá, as it is sometimes written) was until the Portolá Festival in California last year. This volume was the outcome of that festival of October, 1909, commemorating the 140th anniversary of the discovery of San Francisco Bay, by Portolá.

California was a vague country in the 18th century, comprising the peninsula and an unknown, unlimited, tract northward to anywhere, and this volume in its first section tells the story of the march of Don Gaspar de Portolá from the lower, or Baja California to the portion long known as Alta, and the establishment of the first settlement on the coast at San Diego. It was the first land expedition by white men to the region and the actual history of our California begins with this event.

The author tells the story very well and has been careful with his facts.

Portolá was accompanied by Miguel José Serra, better known as Fray Junipero Serra, who went to establish the Church in the new land, and who immediately founded a mission at San Diego, and then many others in the upper country. Mr. Eldredge discredits the popular conception that it was the Church which blazed the way, and lays it rather to political exigencies. While this in a measure may have been the spring behind the occupation, so far as the coast was concerned, it does not appear to hold for the interior, for there the often unaided zeal of the padres broke the path, as, for example, the exploit of Garces, and that of Escalanté.

Portolá is spoken of as the first governor of California, but though perhaps he was nominally governor, it was a title akin to general, for there was no government and nothing to govern, except his own party, during the year that Portolá was there. He reached San Diego June 29th, 1769, and sailed for Mexico from Monterey July 9th, 1770. There is some account of him afterward. He was promoted to Lieut. Colonel and was Governor of Puebla in 1777.

"The Log of the San Carlos," under command of Lieut. Don Juan Manuel de Ayala, from San Blas to San Francisco, is interesting and valuable, as this was the first ship to enter the Port of San Francisco. A summary of a certified copy, now in the archives at Seville, is given, with the report to Bucareli the Viceroy, a description of the bay, and a map by José de Cañizares the pilot. They found the natives friendly, as natives usually are when properly approached. The success of the missions and the practical enslavement of the natives followed the beginnings recorded in this volume, till the *dolce far niente* régime of the padres thrived in a garden of Eden, to be finally shattered by the coming of the American.

**The American Natural History.** A Foundation of Useful Knowledge of Higher Animals of North America. By William T. Hornaday, Director of the New York Zoölogical Park. Illustrated by 227 drawings and 116 photographs. 8vo, xxv+449 pp. American Publishing Company, Hartford, 1906.

Any work on Natural History bearing the name of Mr. Hornaday is abundantly endorsed at the outset. The present volume is particularly addressed to teachers and parents, and these persons should read the book. There are grown people to-day who will assure you that a hair-snake comes from a horsehair which has lain in water; and Mr. Hornaday declares that "fully ninety-five per cent. of students in grammar and normal schools, academies, and small colleges are so inadequately equipped for the study of natural history, including also the great mass of students from the higher colleges and universities, that they enter active life ignorant even of the most important forms of the wild life of our own country." He offers this book as a filler between the technical zoology of the college and the nature-study of the common-schools.

To make the work attractive he skips the lowest forms and begins at once with mammals. There is an excellent introduction describing "The Ground-Plans of Nature," and this must be read by all who are not naturalists. The book is well illustrated from photographs and drawings which assist greatly in understanding the various subjects. The pictures on page 119 are a good example. The question is often asked, "Do elk shed their antlers?" and the answer is here given in four cuts from photographs. No. 1 shows an elk with

but one horn; No. 2 one with no horn; No. 3 in the "velvet"; and No. 4 with the new horns half grown. The dates are given of each photograph. Deer, moose, and caribou shed their horns similarly. A singular thing about the shedding of antlers is the fact that very few old antlers are seen even in a region where there are or have been many deer. One would suppose that being so hard they would accumulate and that the woods would be full of them.

In the description of that past-master in animal engineering the beaver, Mr. Hornaday states that "It is seldom that anybody sees a live beaver in its haunts during the middle of the day," and thus unintentionally conveys the impression that this animal is always almost exclusively nocturnal. This is hardly correct, for, especially on rivers, the beaver in remote places may be seen all day long in numbers. The writer of this makes the statement from personal observation, having years ago seen many beaver and never one at night.

Mr. Hornaday sounds a warning on the rapid disappearance of birds as well as other animals. In every way this is an admirable book.

**British Columbia Coast Names, 1592-1906.** To which are added a few names in adjacent United States Territory. Their Origin and History. With Map and Illustrations. By Captain John T. Walbran. Published by order of Hon. L. P. Brodeur, Minister of Marine and Fisheries of Canada, for the Geographic Board of Canada. 8vo, 546 pp. and map. Ottawa Government Printing Bureau. 1909.

This valuable addition to the dictionaries of geographic names of North America was prepared by Captain Walbran of the C. G. S. "Quadra" in no perfunctory manner, but with deep interest born of long familiarity with the region. The work began in a small way and grew on his hands till the present fine volume came from the press. "The history of a country is often indicated by its names," says the author, and this remark is especially proven all the way round the North American Coasts. But it is not necessary to go beyond the book itself to substantiate this assertion, the very first item of the list indorsing it, "Actaeon Sound" having been named for H. M. frigate of that title; and the second relates how "Active Pass" was named after the U. S. revenue vessel Active. A brief sketch of the Active is added which tells that her former name was Goldhunter. One of her prisoners showed the crew gold dust from the Fraser River Indians and the rush to that region in 1858 was the result. The volume is brimming with valuable historical points. Under "Kitkatla Inlet" there is an interesting page and a half giving a tradition of the Kitkatla Indians, concerning the first appearance of white men, from no less an authority than the noted Mr. William Duncan, who spent his life developing the Metlakatla settlement. These citations serve to illustrate the careful way in which the book has been prepared and its great value to historian and geographer alike.

**Bosnia and Herzegovina.** By Maude M. Holbach. 8vo. 249 pp., 48 Illustrations from Photographs by O. Holbach and Map. John Lane Company, New York, 1910 (?). \$1.50.

Bosnia and Herzegovina were wholly off the tourist routes, a few years ago, but travelers are awakening to the unique and exceptional charms of these two Balkan lands. They are coming into their own, before very long, so far as an influx of tourists may be of advantage to them. They are already the subject



of excellent guide-books, and even the Austrian Government has built a few hotels for the special convenience of the traveling public.

This book was well worth writing, for its author is a good observer, is in love with these countries and tells a great deal about them, their interesting and unspoiled peoples and the unhackneyed beauty and quaintness of this remote part of Europe. The book is thoroughly entertaining, is not superficial and, on the geographic side, it is qualified to be very helpful to most readers.

**Castes and Tribes of Southern India.** By Edgar Thurston, C.I.E., assisted by K. Rangachari, M.A. Seven Vols. Large 8vo. lxxiii and 3287 pp., and numerous full-page illustrations from photographs. Government Press, Madras, 1909. £1 3s.

These seven large volumes contain the results of researches which no agency excepting a government would be likely to undertake; and yet these books relate only to the peoples of the Madras Presidency, and it is to be presumed that they are but a small part of the publications that are to be issued on the same subject; for the Government of India, in 1901, gave its formal sanction to the scheme for a systematic and detailed ethnographic survey of the whole of India, appointed a Superintendent of Ethnography for each Presidency or Province to carry out the work and provided an annual allotment of funds for each of these districts, extending over a period of eight years.

If these published results of the work in the Madras Presidency are indicative of the content and the volume of the reports to come from all the other parts of India, the whole will form a remarkable contribution to our knowledge of the many different castes and tribes of India and will make quite a large library in itself.

Mr. Thurston, superintendent of the Government Museum at Madras, was appointed superintendent of the ethnographical work in the Madras Presidency. The task set him was to record the manners and customs and physical characters of more than 300 castes and tribes, representing more than 40,000,000 persons and spread over an area exceeding 150,000 square miles. A great deal of assistance was obtained from Europeans and educated Indians in various parts of the Presidency and the literary output is also augmented, to an important extent, by the instructions given to the men in charge to supplement their own researches by the study of "the considerable mass of information which lies buried in official reports, in the journals of learned Societies and in various books." Full advantage was evidently taken of this injunction.

A large amount of anthropometric data was procured and these measurements were all made by Mr. Thurston himself in order to eliminate the varying error resulting from the employment of a plurality of observers. The work also included many phonographic records and photographs. The author says that, in the course of his investigations, he became thoroughly convinced that much further delay in carrying out the scheme of the survey would have been fatal.

"Tribes which, only a few years ago, were living in a wild state, clad in a cool and simple garb of forest leaves, buried in the depths of the jungle and living on roots, honey and other forest produce, have now come under the domesticating, and sometimes detrimental influence of contact with Europeans, with a resulting modification of their conditions of life, morality, and even language. The Paniyans of the Wynaad and the Irulas of the Nilgiris, now work regu-

larly for wages on the planters' estates. I have seen a Toda boy studying for the third standard instead of tending the buffaloes of his mand; the abandonment of leafy garments in favor of imported cotton piece goods; the employment of kerosene tins in place of thatch; the decline of the national turban in favor of the less becoming pork-pie cap or knitted nightcap of gaudy hue; the abandonment of indigenous vegetable dyes in favor of tinned anilin and alizarin dyes; the replacement of the indigenous peasant jewellery by imported beads and imitation jewellery made in Europe—these are a few examples of change resulting from western and other influences."

The arrangement of the information is wholly alphabetical. No index is provided and apparently none is needed. All that is written about any one of these many scores of castes and tribes appears under their name, which is printed in heavy black type and repeated at the top of every page as far as the account of them extends. The work is certainly a treasury of information about these many different peoples; and, as time goes on, many of the facts here given will become involved in the changes now in progress and could no longer be recorded.

**Einführung in die Kartenwerke der Königl. Preussischen und Sachsischen Landesaufnahmen. Zweite, vermehrte u. verbesserte Auflage.** Von Edmund Oppermann. vii and 106 pp., and 5 map plates. Small 8vo. Carl Meyer (Gustav Prior), Berlin, 1909. M. 1.25.

An excellent discussion of the map products of the Prussian Government treated as simply as is possible in dealing with a technical subject. It gives a brief history of the development of the Government surveys, and has sections on triangulation, the determination of heights, topographic surveys, scales of map sheets, the cartographic development of land forms, plane table sheets, how to use the Government maps in touring, the topographic general map of Germany, plane table sheets as the basis of geological and regional maps, etc. Prof. Diercke has said that a map is a bit of reading and that its contents can be understood only by those who have learned the cartographic alphabet. Such a book as this will greatly help those who master its contents to learn how to read maps and to get from them all the information they contain. Of course, if we have before us a poor map that does not conform to the rules of good map making, and is not based upon scientific surveys, it means few things very definitely and should be discarded if anything better can be obtained.

**Report on the Dominion Government Expedition to Arctic Islands and the Hudson Strait on board the C. G. S. "Arctic," 1906-1907.** By Captain J. E. Bernier, Officer in Charge and Fishery Officer. 127 pp. 8vo. Ottawa, 1909.

Captain Bernier is as staunch and true an old sea-dog as ever sailed a ship and he is one of the most capable as well as one of the most enthusiastic arctic explorers of our day. Besides planting the Canadian flag on everything in sight, he made a large number of valuable observations and generally kept his eyes open. This volume therefore contains much matter of high value. It describes his 1906-07 voyage and is accompanied by a very good outline map of the northern region, prepared by the Canadian Geological Survey. There are many historical points also, such as copies of inscriptions on the old graves met with, and

of that on the marble tablet left there by Lieut. McClintock, R.N., in 1858, commemorating Franklin, Crozier, Fitzjames, and others. The Franklin Memorial was repaired and a foundation of concrete laid up. There is a short account of the whaling industry in Hudson Bay.

**The Teaching of Geography.** By L. W. Lyde, M.A. 119 pp. Small 8vo. Blackie & Son, L'd., London, 1909. 1s.

A suggestive and helpful book by an author and teacher whose writings have been worthy of wide attention. It has long been his view that geography in the schools should be essentially educational and not merely informing. This volume gives the essence of the methods he has found to be most useful. He says: "I do not believe it possible to use School Geography with the best results, in training the imagination, without emphasizing, above all other things, this matter of geographic control—site control and relief control, but especially climatic control."

**The Respiration of an Inland Lake.** By Edward A. Birge, Secretary of the Commissioners of Fisheries, Wisconsin. Address of the President at the 36th Annual Meeting of the American Fisheries Society, Erie, Pa., July, 1907. Reprinted from the *Transactions*, pp. 223-241. 8vo pamphlet.

The author points out that every inland lake has a respiratory quality, and, in a sense, may be compared to a living being, having its growth, maturity and decay; and many dead lakes may be seen. The lake has an internal and external respiration, absorbing certain gases and throwing off others, which bring about changes in the life-giving property of the water also. There is a great deal in this small pamphlet on phases of lakes that are not generally known.

**Im Bismarckarchipel und auf den Salomoinseln 1906-1909.**

Von Richard Thurnwald. Photo-engravings and map. 8vo. Aus der *Zeitschrift für Ethnologie*, Heft 1, pp. 98-147, 1910.

With the aid of a grant from the Berlin Ethnological Museum, and with the assistance of the authorities of German New Guinea, Dr. Thurnwald was able to devote many months to his studies of these natives. His collections were very large and this paper, giving an extended review of the results of the investigation, is a part of the literary outcome.

**Some of the Triumphs of Scientific Medicine in Peace and War in Foreign Lands.** By Louis Livingston Seaman, A.B., M.D., etc. Late Major Surgeon United States Volunteer Engineers. Read before the New York Academy of Medicine, 1908. Reprint from the *N. Y. Medical Journal*, and Congressional Record. A. R. Elliott Publishing Company, 1908. 31 pp.

Dr. Seaman's address was made to show, among other things, that the glory of scientific medicine is in the prevention of disease rather than in its cure, that a medical officer in the army must have absolute control in his own department, that neglect of public health is a reflection on our civilization, etc. These points are all well taken and Dr. Seaman's position is impregnable. He shows that in all the wars of the United States disease has been responsible for more than 70 per cent of the mortality. This has been the case in most other wars also, excepting, perhaps, on the side of the Japanese in their last war. And "the sons

of Nippon," he says, "treated their prisoners with far more humanity than our nation does its own soldiers." To die for one's country, therefore, is not to fall before the bullets of the enemy, but to waste away from diseases, the result of stupidity and neglect.

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## NEW MAPS

### NORTH AMERICA

#### U. S. GEOLOGICAL SURVEY MAPS

MONTANA. Sketch map of Bearpaw Mt., Montana, showing location of the principal mines and prospects. 1 inch=13 miles. Illustrates "Notes on the Mineral Deposits of the Bearpaw Mts., Mont.," by L. J. Pepperberg. *Bull.* 430-C., Washington, 1910.

NEVADA. (a) Index Map showing the position of the Goldfield district. 1 inch=90 miles [black sketch]; (b) Topographic map of the Goldfield District with lists and locations of shafts. 1:24,000=2,000 ft. to an inch. Contour interval, 20 ft. [colors]; (c) Geologic map of the Goldfield District. 1:24,000. [Tints

for geological formations]; (d) Geologic reconnaissance map of the region adjacent to Goldfield. 1 inch=4 miles. After S. H. Ball. Contour interval, 100 ft. Illustrates Professional Paper 66, "The Geology and Ore Deposits of Goldfield, Nev.," by F. L. Ransome and others, Washington, 1909.

PENNSYLVANIA. Map showing outcrop of paint-ore bed near Lehigh Gap, Pa. 1 inch=3,000 feet. Illustrates "Paint-Ore Deposits near Lehigh Gap, Pa.," by F. T. Agthe and J. L. Dynan, in *Bull.* 430-G, "Advance Chapter from Contributions to Economic Geology. Mineral Paints, 1909," Washington, 1910.

UNITED STATES. Map of United States showing mean Annual Precipitation. 1 inch=190 miles. Prepared by Henry Gannett mainly from data of U. S. Weather Bureau. *Water Supply Paper*, 234, Washington, 1909. [10 tints of blue to show average annual rainfall in inches, with percentage of total area covered by each tint.]

UNITED STATES. Known productive Oil and Gas Fields of the U. S. in 1908. 1 inch=110 miles. Compiled by David T. Day. Illustrates "The Production of Petroleum in 1908," Advance Chapter from "Mineral Resources of the U. S., calendar year 1908," Washington, 1909. [Petroleum areas are shown in yellow and natural gas areas in red.]

UNITED STATES. (a) Sketch map of the Greaterville, Ariz. placer camp. 1 inch=1.1 mile. Illustrates "Notes on the placer deposits of Greaterville, Ariz.," by J. M. Hill. [Shows distribution of dikes, veins, formations, placer gravels, etc.] (b) Sketch map of northern part of Trinity Co., Cal. 1 inch=18 miles. Illustrates "The Weaverville-Trinity Center gold gravels, Trinity Co., Cal.," by D. F. MacDonald. (c) Map of a portion of the Sumpter quadrangle, Oregon, showing distribution of gold-bearing gravels with relation to glaciated areas. 1 inch=6 miles. Illustrates "Placer gravels of the Sumpter and Granite districts, eastern Oregon," by J. T. Pardee. In *Bull.* 430-A, "Advance Chapter from Contributions to Economic Geology. Gold and Silver, 1909," Washington, 1910.

UNITED STATES. (a) Sketch Geologic map of part of Idaho-Wyoming border country. 1 inch=5 miles. Illustrates "The salt resources of the Idaho-Wyoming border, with notes on the geology," by C. L. Breger. (b) Map showing the more important soda deposits in Wyoming. 1 inch=110 miles. (c) Map showing location of "Western Alkali Company's soda wells at Green River, Wyo.," with detailed plan of the plant. Illustrate "Deposits of sodium salts in Wyoming," by A. R. Schultz. In *Bull.* 430-1, "Advance Chapter from Contributions to Economic Geology. Salines," by C. L. Breger and A. R. Schultz, Washington, 1910.

WASHINGTON AND OREGON. (a) Map of Washington and Oregon showing distribution of Limestone. 1 inch=75 miles [Limestone areas in black]; (b) Map of Portland, Ore., and vicinity, showing distribution of structural materials. 1:62,500=0.9 miles to an inch. By N. H. Darton. [In colors.] Illustrate *Bull.* 387, "Structural Materials in parts of Oregon and Washington," Washington, 1909.

#### U. S. HYDROGRAPHIC OFFICE CHARTS

Pilot Chart of the North Atlantic Ocean, July, 1910.

Pilot Chart of the North Pacific Ocean, August, 1910.



## U. S. WEATHER BUREAU CHARTS

Meteorological Chart of the North Atlantic Ocean, August, 1910.

Meteorological Chart of the North Pacific Ocean, August, 1910.

## DEPARTMENT OF AGRICULTURE MAPS

UNITED STATES. Soil Survey Maps of Lamar Co., Ala.; Grady and Thomas Cos., Ga.; Camp and Overton Cos., Tex.; Reconnaissance soil survey of south Texas. Scales, 1 inch=1 mile and 1 inch=6 miles. [In colors, with contours of elevation and descriptive text.]

CANADA. Pelly, Ross and Gravel Rivers, Yukon and North West Territories. 1:506,880=8 miles to an inch.  $61^{\circ} 15' - 65^{\circ} N.$ ;  $124^{\circ} - 133^{\circ} W.$  Illustrates "A Reconnaissance across the Mackenzie Mts. on the Pelly, Ross and Gravel Rivers" by Joseph Keele. No. 1097, Can. Dep't. of Mines, Geol. Surv. Branch, Ottawa, 1910. [In colors with descriptive notes, topography along the rivers in black and geological detail in red lettering.]

CANADA. St. Bruno Mt., Quebec. 1:9,600=800 feet to an inch. By W. B. Boyd. (a) Topography; (b) Areal Geology. Illustrate "Geology of St. Bruno Mt., Quebec," by John A. Dresser, No. 1077, *Memoir* No. 7. Can. Dep't. of Mines, Geol. Surv. Branch, Ottawa, 1910.

## AFRICA

TRANSVAAL COLONY. Geological Map of the Pilgrims Rest Gold Mining District. 1 inch=2.25 miles.  $24^{\circ} 25' - 25^{\circ} 15' S.$ ;  $30^{\circ} 15' - 30^{\circ} 58' E.$  Illustrates "The Geology of the Pilgrims Rest Gold Mining District," by A. L. Hall. Transvaal Mines Dep't., Geol. Surv., Mem. No. 5, Pretoria, 1910. [Colors for geology and hydrography with relief features in dark tones. This district, after the Rand, is the most important goldfield of the Colony.]

## ASIA

SIAM. (a) Map of Siam showing areas included in recent Surveys. 1:5,000,000=78.9 miles to an inch. [The Cadastral Survey, confined to a large area around Bangkok and a small area around Chantaburi is shown in brown; the Topographical Survey, in the northwestern and extreme southern parts of the kingdom, is in green. The mountain features throughout Siam are approximately shown in brown contours.] (b) Map showing area cadastrally surveyed, Oct. 1, 1907. 1:800,000=12.6 miles to an inch.  $13^{\circ} - 15^{\circ} 10' N.$ ;  $99^{\circ} - 102^{\circ} E.$  [The area surveyed is distinguished from the area traversed for detail survey.] (c, d,) Maps of Krung Kao and Pachin Provinces showing progress of Cadastral Survey. 1:400,000=6.3 miles to an inch. (e) Index Plan, Ratburi Province, Traverse Survey. 1:400,000. (f) Index Map of Triangulation Survey, Island of Puket. 1:160,000=2.5 miles to an inch. (g) Index Plan showing progress of Bangkok City Survey, 1908. 1:50,000=0.7 miles to an inch. (h) Plan showing progress of Survey, Province of Pitsanulok. 1:900,000=14.2 miles to an inch. Plan showing progress of Survey, Province of Pa-Yap. 1:1,500,000=23.67 miles to an inch. *General Report on the Operations of the Royal Survey Department of Siam, 1906-1907.* Bangkok, 1909. [The Report and Maps are published in English.]

## AUSTRALASIA AND OCEANIA

PAPUA-GERMAN NEW GUINEA. Tracing to show the work done by the British Commissioner, Anglo-German Boundary Commission, January-July, 1909. 1 inch=4 miles. Illustrates "Papua: Report for the Year ended 30th June, 1909." [A black sketch showing Anglo-German boundary as delimited, with geographical features on both sides of it. The object was to fix the position of the 8th parallel of S. Lat. which, for some distance forms the boundary between German New Guinea and Papua. The work was begun in January, 1909, and was expected to be finished in October.]

## EUROPE

FRANCE. (a) Schéma du Bassin des Dranses; (b) Bassin des Usses; (c) Bassin du Fier; (d) Bassin du Lac du Bourget; (e) Bassin du Guiers; (f) Bassin de la Bourbre; (g) Bassin de la Gère; (h) Bassin des Collières; (i) Bassin de la Galaure; (j) Bassin de la Drôme; (k) Bassins du Roubion et de la Barre; (l) Bassin du Lez; (m) Bassin de l'Eygues. 1:200,000=3.1 mile to an inch. Illustrate "Compte Rendu et Résultats des Études & Travaux au 31 Dec., 1907, Tome 3, Service d'Études des Grandes Forces Hydrauliques (Région des Alpes). Ministère de l'Agriculture, Paris, 1908. [Each principal basin with the component basins forming it is indicated; hydrography in blue, gauging and rain stations shown and also distribution of hydraulic power plants.]

FRANCE. Carte des Gisements de Coquilles comestibles de la Côte sud du Finistère comprise entre la Pointe Trévignon et la Pointe de Penmarc'h. 1:51,500=0.81 mile to an inch. In colors. By J. Cuérin-Ganivet. Illustrates *Bull.* de l'Institut de Océan., No. 170, Monaco, 1910.

FRANCE. Carte des Gisements de Coquilles comestibles de la partie des côtes de l'Ille et Vilaine comprise entre le Cap Fréhel et la Pointe du Grouin. 1:46,000=0.72 mile to an inch. Dressée par L. Joubin. In colors. Illustrates *Bull.* de l'Institut de Océan., No. 172, Monaco, 1910.

ITALY. (a) Geologische Karte der Adamello-Gruppe. 1:75,000=1.18 mile to an inch. Aufgenommen 1888-1891, 1894-1896, 1898-1900, 1902, 1904 von Wilhelm Salomon. [25 symbols, nearly all colored, are used for geological formations, lakes, glaciers, and locations in which fossils were found. The colors and nomenclature are imposed upon a topographic base map, the relief forms being shown by hachuring and contrasts of light and shade. Many elevations are given in meters and, scattered over the map, are five devices for showing different angles of slope.] (b) Kärtchen der vom Verfasser begangenen Routen. 1:200,000=3.1 mile to an inch. [Routes in red.] Illustrate "Die Adamello-gruppe, ein alpinen Zentralmassiv und seine Bedeutung für die Gebirgsbildung und unsere Kenntnis von dem Mechanismus der Intrusionen," by Wilhelm Salomon. *Abhandl. der. k. k. Geologischen Reichsanstalt*, Band 21, No. 1, Vienna, 1908. [These maps are fine specimens of the work of the renowned k. u. k. militär geographisches Institut of Vienna.]

SPAIN. (a) Anciennes Routes de Transhumance en Spain. 1:5,000,000=78.9 miles to an inch. (b) Voies ferrées servant à la Transhumance en Espagne au Début du xxe Siècle. 1:5,000,000. [Colored maps showing distribution of winter sheep pasturage in Spain and the old and new routes for transferring sheep from one grazing district to another.] (c and d) black maps, 1:12,500,000, showing distribution of sheep in Spain and the number of sheep transferred per 100 square

kilometers. Illustrate "La Transhumance en Espagne," by A. Fribourg. *Ann. de Géog.*, Vol. 19, No. 105, Paris, 1910.

## OCEANS

NORTH ATLANTIC. Atlantique Nord.  $16^{\circ}$ - $58^{\circ}$  N.;  $0^{\circ}$ - $82^{\circ}$  W. Four black charts illustrating "Bouteilles, Glaces et Carcasses flottantes de 1837 à 1909, d'après les Pilot-Charts." By A. Hauteux. *Bull. de l'Institut de Océan.*, No. 173, Monaco, 1910.

## HISTORICAL GEOGRAPHY

EARLY NEW YORK. Five maps in portfolio. By Townsend MacCoun:

(a) 1609. The Island of Manhattan (Mannahtin) at the time of its discovery; showing its elevations, water-courses, marshes and shore line. Based upon the early colonial surveys of Ratzer, Montresor, Knyphausen, Bradford, Duyckinck, etc., and the Survey of 1867 by Gen. E. L. Viele. Identified Indian nomenclature in red. Present streets and shore line for identification. 47 x 12 inches. New York, 1909.

(b) 1609. The Hudson River (Cahohatatea), at the time of its discovery by Henry Hudson. The Indian names are obtained from the Dutch Colonial Records; the deeds and patents of the Van Rensselaer, Schuyler, Livingston, Van Cortlandt and Philipse families. As the spelling of Indian names differs greatly the earlier forms have been generally adopted. 31.5 x 6.5 inches. New York, 1909.

(c) 1653-1664. AMSTERDAM IN NEW NETHERLAND. The City of the Dutch West India Company. The personal names are those of the more prominent citizens of that period with the location of their homes. The principal points of interest are in red. 20 x 13 inches. New York, 1909.

(d) 1730. New York, the English Colonial City. The principal points of interest for this period are in red. 20 x 13 inches. New York, 1909.

(e) 1783. Manhattan Island at the close of the Revolution. Showing the American City with its Landmarks and the Revolutionary Fortifications on the Island. Outline of the city as then laid out in streets, and roads leading north, are in red. 47 x 12 inches. New York, 1908.

[The author, who is well known for his contributions to historical geography, has performed a public service in compiling these careful and well executed maps. They are a very convenient and useful series with the aid of which one may take a cartographic short cut to a great deal of important geographical information relating to the early historical days of Manhattan Island and the Hudson river; and they will be equally serviceable to those who read the literature of the subject.

Perhaps the most interesting features of Map *a* are its delineation of the hydrography of Manhattan before it was captured and practically annihilated by civilization; and its graphic revelation of the filling in of the shore waters and the building out of the shore line for the purposes of the dockage system along the lower part of the island. On Map *b* a large number of the Indian names for tributaries of the Hudson, and other geographical features are given, from New York Bay to north of Albany. The three maps (*c*, *d* and *e*), showing the development of the colonial city in the Seventeenth and Eighteenth centuries are certainly superior in the care with which they have been compiled and the manner of presenting the material to many of their predecessors.]

## ATLASES

ATLAS GÉNÉRAL VIDAL-LABLACHE. Histoire et Géographie. 420 Cartes et Cartons. Index alphabétique de 46,000 noms. Librairie Armand Colin, 1909. [As the parts of this excellent and standard atlas were reissued for the present revision of the work, the *Bulletin* called attention to the superior production of these maps, to the large number of small insets giving a great deal of information that cannot be included on the main maps, to the important attention that is given to the physical and economic aspects of all countries and to the explanatory text at the bottom of each sheet which helps the reader to make the maps useful in the highest degree. For a general household atlas, embracing historical as well as regional geography, this work has no superior for those who can read French.]

A SCHOOL ECONOMIC ATLAS. By J. G. Bartholomew LL.D. With Introduction by L. W. Lyde, M. A. 64 quarto pages of Maps and Diagrams. Clarendon Press Oxford, and American Branch, Clarendon Press, New York, 1910. [Several of the leading nations now have one or more economic atlases for use in the teaching of economic geography in the secondary schools. It would be expected that any work of this kind, produced by the leading cartographic house in the English speaking world, would be a superior work of this class; and an examination of it shows that this expectation is fully realized. It may be recommended to the schools or the general public of America as an admirable cartographic presentation of the economic interests of the world and of the physical and other influences that affect the distribution and quantity of production, manufactures and trade. The physical and climatic maps are of the greatest utility because they illustrate best the ordinary processes of geographical control. The maps following them, and dealing with the distribution of commercial products, become highly significant when used, as they are intended to be used, in close connection with the physical and climatic maps that lead up to them. No school economic atlas has been more consistently and effectively designed than this one to inculcate throughout the fundamental principles upon which the correct study of economic geography depends.]

The first 13 plates are general world maps illustrating the broad features of geographical control and the economic importance of race, religion, etc. We may illustrate the plan of the maps of the continents by citing the series devoted to North America:

On pp. 40, 41 are eight maps of the continent giving the January and July isotherms, the January and July rainfall, outlining the orography in tints of blue for sea depths with white for the continental shelf and tints of green, yellow and brown for the land elevations; five tints each for the vegetation and density of population maps; a political map. P. 42 is an industrial map showing navigable rivers and principal railroads with tints for the distribution of agriculture, livestock, mining, fishing and the chief manufacturing districts, the nature of the leading industries also being indicated. P. 43 is an economic map of the United States and Canada giving this information in all the most important detail. This is the first school economic map on which we have seen petroleum included among the products of Illinois where, for several years, it has been an industry.

The maps are well produced and are easily read, which is not the case with some of the best German economic school maps.]